997.13 DPWH
01-22-2018

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
CENTRAL OFFICE
Manila

18 JAN 2018

DEPARTMENT ORDER)
)
NO. 13)
Series of 2018

SUBJECT: Guidelines for the Preparation of Cost Estimates for Traffic Management and Safety & Health Requirements for the Construction and Maintenance of Roads, Bridges and Safety & Health Requirements for School Buildings

In order to ensure proper implementation of road works safety & traffic management and construction safety & health program during the construction and maintenance of all roads, bridges and school building projects under the DPWH infrastructure program, all Implementing Offices of this Department are hereby directed to adopt the subject Guidelines (Annex "A") which prescribes the minimum requirement of the said items in the preparation of Program of Works (POW), Approved Budget for the Contract (ABC) and Detailed Unit Price Analysis (DUPA).

The cost estimates for these items shall include supply of materials, installation and maintenance considered for the entire duration of the project on a lump sum basis as specified in the guideline to be supported with detailed breakdown of requirements and cost computations in the DUPA. The project's safety & health and traffic management requirements shall be considered under Item B.7 – Occupational Safety and Health Program, Item B.8 – Traffic Management, Item 605 – Road Signs and other applicable items as prescribed in the revised standardized pay items of works per latest approved department issuances. Further, a complete quantity and description of traffic management and construction safety and health requirements shall be indicated in the Annex supplied for the particular pay item in the bill of quantities of the Bid Documents. This shall be provided to all interested bidders to ensure proper compliance of requirements and monitoring during project implementation.

The derivation of quantities and cost estimates for the aforementioned items shall be based on the approved Traffic Management Plan (TMP), Construction Safety and Health Program (CSHP) and other identified safety requirements of the project. Such cost shall not exceed the allowable percentage per project category as shown in Table No. 5 to Table No. 8 of the said Guideline (Annex "A").

In case of a cost percentage higher than 10% of what is prescribed to address the actual requirements, the head of the implementing office shall seek review of the TMP and CSHP from the Bureau of Quality and Safety (BQS) and corresponding review of cost from the Bureau of Construction (BOC).

This Order supplements the existing DPWH Road Works Safety Manual, Series of 2004; D.O. No. 56, Series of 2005 – Guidelines for the Implementation of DOLE D.O. No. 13, Series of 1998 on Occupational Safety and Health in the Construction Industry; D.O. No. 36, Series of 2007 – Provision and Installation of Road Safety Devices along Critical Sections of all DPWH Preventive Maintenance/ Asphalt Overlay and Reblocking Projects; and D.O. No. 103, Series of 2016 – Guidelines in the Preparation of Provision and Maintenance of Traffic Control as Pay Item in the Approved Budget for the Contract (ABC) on Infrastructure Projects.

This Order shall take effect immediately.

MARK A. VILLAR
Secretary

6.1.3 ECG/AMD/WRO

Department of Public Works and Highways
Office of the Secretary
WIN8W02050

Guidelines for the Preparation of Cost Estimates for Traffic Management and Safety & Health Requirements for the Construction and Maintenance of Roads, Bridges and Safety & Health Requirements for School Buildings

2018

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

FOREWORD

The Department of Public Works and Highways (DPWH) being the primary engineering and construction arm of the government recognizes its responsibility to enforce compliance to the Occupational Safety and Health Standards established by the Department of Labor and Employment (DOLE). In its effort to impose the required construction safety practices, challenges in the compliance with the standards, however, have been encountered.

Relentless in its pursuit of providing a safer work environment, this **Guidelines for the Preparation of Cost Estimates for Traffic Management and Safety & Health Requirements for the Construction and Maintenance of Roads, Bridges and Safety & Health Requirements for School Buildings** was prepared with the intent of improving the implementing offices' means of preparing cost estimate/budget on safety requirements particularly for road, bridge, and school building projects. It targets to serve as a preparatory work in imposing the presentation and quantification of detailed safety requirements in the preparation of the Program of Works (POW) and Approved Budget for the Contract (ABC) and further, in the Bid Documents for contractors to be informed of the detailed requirements to be provided on site.

It is hoped that adherence to this guideline shall further promote compliance of DPWH projects on the aforesaid Safety and Health Standards through ensuring the provision of right cost of construction safety requirements.

MARK A. VILLAR

Secretary

Department of Public Works and Highways
Office of the Secretary

WIN8W02050

Table of Contents

Table of Contents

Introduction

When it comes to maintenance and construction works, safety must be of utmost priority. In the process of delivering civil works to address the needs of the Filipino people specifically in providing quality and safe infrastructure, safety during maintenance and construction works must be at the top of the minds of the implementing agencies and contractors to protect the workers as well as the people residing nearby and traveling public who use the adjacent/detour lanes. Preventive methods by risk mitigation and reduction of construction hazards through implementation of standard safety practices, complete and consistent use of personal protective equipment, adequate temporary road works traffic control (directional, regulatory, and warning signs, barriers, traffic cones, and other road safety devices), are the best solutions to minimize, if not eliminate, the occurrence of road crashes and untoward incidents.

In the Philippines, the Department of Labor and Employment (DOLE) leads the formulation, implementation and compliance monitoring of the Occupational Safety and Health Standards (OSHS)—the governing standards in the country's construction industry in terms of occupational safety and health. Correspondingly, the Department of Public Works and Highways (DPWH), as the primary engineering and construction arm of the government, has been seeking to continually reinforce the implementation of such standards by issuing guidelines and procedures through Department issuances and manuals.

Challenges in the compliance with the standards, however, have been encountered. The Department's engineers have encountered difficulty in imposing to the contractors the site safety requirements that are not presented in detail in the Contract or in the Program of Works. The major contributing factor is the lack of understanding of engineers and the contractors particularly on the standards related to the implementation of road works safety, traffic management and construction safety and health.

Thus, this cost estimation guideline entitled **Guidelines for the Preparation of Cost Estimates for Traffic Management and Safety & Health Requirements for the Construction and Maintenance of Roads, Bridges and Safety & Health Requirements for School Buildings** is hereby presented to introduce improvement in the Department's pursuit of further enhancing and sustaining the compliance to such safety standards particularly in the methods of deriving the cost and budget for construction safety requirements.

About this Guideline

Guidelines for the Preparation of Cost Estimates for Traffic Management and Safety & Health Requirements for the Construction and Maintenance of Roads, Bridges and Safety & Health Requirements for School Buildings

This guideline basically presents methods on how to prepare detailed cost estimate for road works safety, traffic management, and general construction safety and health requirements to be reflected in the Detailed Unit Price Analysis (DUPA) and Program of Works (POW) required for every project particularly for roads, bridges, and buildings.

Relevant guidelines and manuals adopted and referred herein are the DPWH Road Works Safety Manual, 2004, DOLE D.O. 13, Series of 1998, and D.O. 56, Series of 2005. As an improvement to the DPWH Road Works Safety Manual, 2004, this guideline introduced minimum safety requirements on construction safety for bridge, drainage with deep excavations and building. Illustration of construction sequences particularly for road works were also included. The necessary traffic management schemes as part of a traffic management plan and corresponding Detailed Unit Price Analysis (DUPA) for traffic management and construction safety & health requirements are presented in this guideline for the purpose of illustrating the steps for cost computation thus, the implementing offices should verify the prevailing costs in their area in the preparation of POW and DUPA.

Every project is unique so, road works safety & traffic management and construction safety & health requirements vary depending on the actual site condition, programmed items of work and other foreseen necessities. Hence, contents herein would only serve as a guide as to what are advisable and minimum requirements. Modifications may be made if deemed necessary.

- **General Objective**

  In a more holistic perspective, this guideline aims to impart on the Department's effort of improving the proper implementation of construction safety and health program on all projects handled by DPWH. This cost estimation guideline intends to improve the implementing offices' means of preparing cost estimate/budget on safety requirements particularly for road, bridge, and building projects. It targets to serve as a preparatory work in imposing the presentation and quantification of detailed safety requirements in the preparation of the Program of Work (POW) and Approved Budget for the Contract (ABC) and further, in the Bid Documents for contractors to be informed on the detailed requirements to be provided on site. Moreover, this guideline aims to establish a baseline cost of safety requirements (in percentage) relative to a project's cost of civil works.

- **Specific Objectives**

  1. To present the construction safety requirements and its application on road, bridge, and building projects commonly implemented by DPWH.
  2. To illustrate the quantification of requirements and the corresponding preparation of cost through Detailed Unit Price Analysis (DUPA).
  3. To present a matrix of the project's cost of safety requirements versus the cost of civil works.

Part - A

General

A – 1 Acronyms and Definition of Terms

ACRONYM

ABC
Approved Budget for the Contract

CSHP
Construction Safety and Health Program

DO
Department Order

DOLE
Department of Labor and Employment

DUPA
Detailed Unit Price Analysis

POW
Program of Work

PPE
Personal Protective Equipment

OSHS
Occupational Safety and Health Standards

DEFINITION OF TERMS

Dimension (D)

The dimension 'D' relates to distances for signage locations and taper lengths for different vehicle approach speeds. It is expressed in meters equal to the approach speed of traffic in kilometers per hour. For example, if the approach speed of traffic is 60 kph then the dimension D is 60 meters.

High Speed Road

Road sections with traffic approach speed between 60 kph and 80 kph

High Volume Road

Road sections accommodating 1,500 or more vehicles per day

Long Term Works

Works taking longer than a day and need to be provided with signage overnight and are commonly applicable for road and bridge works implemented by contract.

Low Speed Road

Road sections with traffic approach speed of less than 60 kph

Low Volume Road

Road sections accommodating less than 1,500 vehicles per day

Road Works Traffic Control

Activity which involves directing vehicular and pedestrian traffic around a construction zone or other road disruption through the provision of directional, regulatory, and warning signs, barriers, traffic cones, traffic controllers, and other devices to regulate, warn, or guide road users in order to attain safe and efficient movement of vehicles, pedestrians, bicyclists, workers, and the general public.

Short Term Works

Works to be completed within a day and need not be provided with signage overnight. This is usually applicable for road and bridge routine maintenance works usually performed by administration.

Temporary Signage

Construction safety signage installed for purposes of warning, informing and controlling the workers and the public on an on-going construction operation.

Traffic Management

The application of specific traffic control practices over a length of road or over an area, to achieve specified objectives like reduction of traffic congestion or regulation of traffic flow, which may be set by a governing agency (DPWH) responsible on arterial roads or the Local Government Unit (LGU) responsible on provincial and local roads.

Traffic Management Plan

A site-specific plan showing the proposed worksite layout with detailed description and location of signs, traffic control devices, and equipment at different stages of construction. It also describes the details on how work personnel, the public, and those who will be impacted by the work can be safely and efficiently guided through a roadwork site so that the road network is kept at a satisfactory level of performance.

Very High Speed Road

Road sections with traffic approach speed greater than 80 kph

A – 2 Procedural Guidelines – D.O No. 13, Series of 1998

Guidelines Governing Occupational Safety & Health in the Construction Industry

A – 2.1 Personal Protective Equipment (PPE)

For General Construction Work, basic PPE for all construction workers are the following;

a. Safety Helmet / Hard hat
b. Safety Gloves
c. Safety Shoes

Specialty PPE as listed below shall be provided to workers in addition to or lieu of the corresponding basic PPE as the work or activity requires.

Table 1 - Required Specialty Personal Protective Equipment as per DOLE D.O. 13, Series of 1998

Construction Work/ Activity	Specialized PPE	Remarks
1. Work near unprotected areas such as but not limited to the following a. Working scaffolds b. Working on roofs	1. Safety Belt	Where there is a possibility of fall that will normally cause disabling injury
2. Work involving pouring of concrete such as but not limited to the following a. Laying concrete slab b. Pouring of concrete for beams and/or columns	1. Safety chemical resistant boots	If worker's feet may have contact with fresh concrete
	2. Chemical resistant gloves	If worker's hands may have contact with fresh concrete
3. Work involving laying of asphalt	1. Heat resistant gloves	If worker needs to work on or near hot asphalt
	2. Heat resistant safety footwear	
4. Working with derricks and cranes	1. Color-coded vest with reflectorized markings	Proper visibility and identification of critical persons such as operators, riggers, signal men
	2. Heavy leather gloves	For riggers
	3. High visibility gloves	For signal men
5. Working with earth moving equipment	1. Heavy duty safety footwear	Safety shoes for relatively dry or sheltered work
		Water and mud resistant boots for wet outdoor works
	2. Ear muff or ear plugs	When working near or on noisy equipment
	3. High visibility gloves	For spotters
	4. High visibility vest	For all workers within immediate vicinity equipment

Construction Work/ Activity	Specialized PPE	Remarks
6. Manual excavation or digging	1. Padded Vest	When work may involve being hit by falling materials
7. Work on top of or near bodies of water	1. Life vest	When there is danger of fall into deep water
	2. Safety belt	
8. Work where hot cutting and welding of metals are involved	1. Heat resistant light filtering face shield	For welders and gas cutters
	2. Heat resistant and heat insulating gloves	
	3. Metal fume filtering respirators	
	4. Heat resistant protective clothing	
	5. Light filtering and heat resistant face goggles	For gas cutting in lieu of face shield
9. When working with live electricity above 50 volts AC or DC	1. Electrically insulated gloves	Electrical resistance must be suitable for the maximum electrical voltage of energized parts that may be handled by worker
	2. Electrically insulated safety shoes	
10. Work involving exposure to or handling of hot materials or work near open flame	1. Heat resistant and heat insulating gloves	For handling of hot substances and materials
	2. Heat insulating protective clothing	For working in hot working environment
	3. Heat resistant face shield	For working near open flame
11. Work involving handling of noisy and/or vibrating power tools/ equipment	1. Vibration insulating gloves	Recommended total cumulative actual usage of tool shall be a maximum of 2 hours per day (for 8-hour work, duty cycle should be 1:4)
	2. Ear protection	When power tool generates noise of more than 85 dB
12. Work involving exposure to harmful dust	1. Dust filtering respirators	If dust concentration is above recommended Threshold Limit Value (TLV) for the contaminant

Construction Work/ Activity	Specialized PPE	Remarks
13. Work that may involve shortage of oxygen	1. Self-contained or supplied air respirator	Work in confined spaces or work involving depletion of oxygen supply
14. Working with organic solvent or toxic and/or corrosive chemicals	1. Chemical resistant gloves	If work involves handling of chemicals
	2. Chemical filtering respirator	If chemical emits vapors above recommended TLV for the contaminant chemical/s
	3. Chemical resistant face shield	If work may involve chemical splashes to the face
	4. Chemical goggles	If chemical vapors may irritate eyes
	5. Chemical resistant protective clothing	If work will involve chemical splashes to the body of worker
15. Working with atmospheres containing contaminants above recommended threshold limit values for airborne contaminants	1. Appropriate contaminant filtering respirator	For atmospheres containing not more than ten times the recommended TLV
	2. Contaminant protection for eyes	If contaminant may irritate eyes
	3. Self-contained or supplied air respirator	For environment containing more than ten times the recommended TLV
	4. Chemical suits	If contaminant may enter through skin
16. Working under high pressure		
17. Working near vehicular traffic	1. PPEs with Reflectorized or luminous markings for high visibility	
	2. Heavy duty safety shoes	
18. Work which involves working underwater	1. Self-contained or supplied air underwater breathing apparatus	
	2. Thermal insulating wet suit and accessories	If work involves long exposure to cold water
19. Working at night under low lighting conditions	1. High visibility vest	

A – 2.2 Safety and Health Personnel

Based on Section 1033, Rule 1030 and Section 8 of DOLE D.O 13, Series of 1998 of the Occupational Safety and Health Standards (OSHS as Amended 1989), the following number of safety personnel and emergency occupational health personnel and facilities are required depending on the number of workers.

Table 2 – Considerations in the employment of safety man and emergency health personnel

Number of Workers	Number of Safety Man
Hazardous Workplace	
200 and below	One (1) part-time safety man
Over 200 to 1000	One (1) full-time safety man
For every 1000 workers	One (1) full-time safety man
Non-hazardous Workplace	
Less than 1000	One (1) part-time safety man
For every 1000	One (1) full-time safety man
Number of Workers	**Number of Emergency Health Personnel**
Less than 50	One (1) full time certified first-aider
Over 50 to 200	One (1) full-time registered nurse
Over 200 to 300	One (1) full-time registered nurse One (1) part-time physician One (1) part-time dentist *And an emergency clinic*
Over 300	One (1) full-time registered nurse One (1) full-time physician One (1) full-time dentist *And an infirmary or emergency hospital with one (1) bed capacity*

A part time safety man shall be allotted at least four (4) hours per week to perform the duties as safety man. With regard to the provision of emergency hospital, Section 1963.03 of OSHS states that an employer may not establish an emergency hospital or dental clinic in his workplace as required if a hospital or dental clinic which is located not more than 5 kilometers away from the workplace or which can be reached in 25 minutes of travel is situated and the employer has facilities readily available for transporting workers to the hospital or clinic in case of emergency.

A – 2.3 Signage and Barricades as Prescribed in the Procedural Guidelines of DOLE D.O 13, Series of 1998

Construction Safety Signage shall be provided as a precaution and to advise the workers and the general public of the hazards existing in the worksite.

2.3.1 Signage Procedures

As per DOLE's requirement, the signage shall be;

a. Posted in prominent positions and at strategic locations

b. As far as practicable, be in the language understandable to most of the workers employed in the site.

c. For non-raised floor areas, the attached yellow CAUTION sign shall be used when using yellow CAUTION TAPE.

d. For non-raised floor areas, the attached red DANGER sign shall be used when using the red DANGER TAPE.

e. Placed in designated areas at 1.20 meter from the ground level, if there is no other more practicable height.

f. Regularly inspected and maintained in good condition to achieve its purpose. Signage that are damaged; illegible or that no longer apply as to purpose, site or language, shall be removed or replaced by the safety officer when needed.

g. Removed after the hazard is completely eliminated. If upon work completion that hazard is still present, the signage shall remain in place.

h. Designed and constructed following the Overall Dimensions of Safety Signs Formula as required by the OSHS.

i. Specific with the type of hazard and should indicate the name of the contaminant/ substance involved (for chemical hazards), and the type of PPE or respiratory equipment to be worn.

2.3.2 Posting of Signage

Posting of signage shall include, but not limited to the following places:

a. Areas where there are risks of falling objects.

b. Areas where there are risks of falling, slipping, tripping among workers and the public

c. Prior to entry in project sites, locations and its perimeter.

d. Where there is mandatory requirement on the usage of PPEs.

e. Areas where explosives and flammable substances are used or stored

f. Approaches to working areas where danger from toxic or irritant airborne contaminants/ substances may exist.

g. All places where contact with or proximity to electrical facility/ equipment can cause danger.

h. All places where workers may come in contact with dangerous moving parts of machinery or equipment

i. Locations of fire alarms and fire-fighting equipment

j. Locations for instructions on the proper usage of specific construction equipment, tools.

2.3.3 Barricading Procedures

In barricading, the following shall apply:

a. The contractor shall provide all necessary barricades, safety tapes, safety cones or safety lines as required in isolating or protecting an unsafe work area from other workers, pedestrians or vehicular traffic.

b. Barricades shall completely enclose the hazardous area and effectively limit unintentional or casual entry.

c. Barricades shall be 0.90-meter vertical height from the ground, when no other more practical height specification is available.

d. Barricades shall be maintained in good condition to achieve its purpose

e. Barricades that are damaged; faded or that no longer apply as to purpose, site or meaning, shall be removed or shall be replaced by the safety officer.

f. Barricade tape shall not be used on the floor as this presents a slipping hazard of its own.

g. In addition to using the proper warning tape, the contractor shall use the appropriate safety signage when barricading an area.

h. All barricades shall be removed after hazard is completely eliminated.

i. Upon work completion, if the hazard is still present, the barricade shall remain in place.

2.3.4 Installation of barricades

Installation of barricades shall include, but not limited to the following worksite conditions:

a. Hazardous areas
b. Trip hazard
c. Robotic movement
d. Energized electrical works
e. Overhead suspended load test
f. Critical high pressure test
g. Chemical introduction
h. Fall exposure
i. Emergency Response Zone
j. Unsafe condition zone
k. Danger zone
l. Confined and enclosed space

A – 3 Reference Laws, Policies, Manuals, and Guidelines

In the preparation of this guideline, the following are the basis and references which the user may need for more detailed information:

a. Handbook on Philippine Government Procurement (R.A. 9184)

b. DOLE D.O. 13, Series of 1998

The Guidelines Governing Occupational Safety and Health in the Construction Industry

c. D.O. 135, Series of 2015

Strict Compliance to the Road Works Safety & Traffic Management and Construction Safety and Health Requirements during Construction and Maintenance of Roads and Bridges

d. Department Circular No. 29, Series of 2015

DOLE and DPWH Joint Memorandum Agreement on the Approval of CSHP of Government Infrastructure Projects

e. D.O. 197, Series of 2016

Revised Guidelines in the Preparation of Approved Budget for the Contract (ABC)

f. D.O. 129, Series of 2014

Guidelines in the Implementation of Memorandum Dated July 17, 2014 of the Secretary of DOLE on the Procedure in the Evaluation of Construction Safety and Health Program (CSHP) of Contractors Engaged by DPWH Pursuant to DPWH D.O. No. 56, Series of 2005

g. D.O. 54, Series of 2012

Guidelines on Reblocking of Portland Cement Concrete Pavement

h. D.O. 44, Series of 2012

Standardization of Construction Duration of DPWH Projects

i. D.O. 41, Series of 2012

Adoption of the Revised Manual on DPWH Highway Safety Design Standards May 2012 Edition

j. D.O. 13, Series of 2008

Guidelines in the Procurement and Installation of Road Safety Devices and Facilities

k. D.O. 56, Series of 2005

Guidelines in the Implementation of DOLE D.O. No. 13, Series of 1998 on Occupational Safety and Health in the Construction Industry

l. Department Circular No.09, Series of 2004

Road Safety Manuals and Handbooks

m. Department Order No. 70, Series of 1998

Traffic Alleviation for Major DPWH Projects along Heavily Thoroughfares in Metro Manila

n. DPWH Road Works Safety Manual, 2004

o. DPWH Highway Safety Design Standards Part 2: Road Signs and Pavement Markings Manual

p. DPWH Construction Materials Price Data and Labor Rates

Part - B

Cost of Road Works Safety & Traffic Management

B – 1 General Steps in Cost Derivation

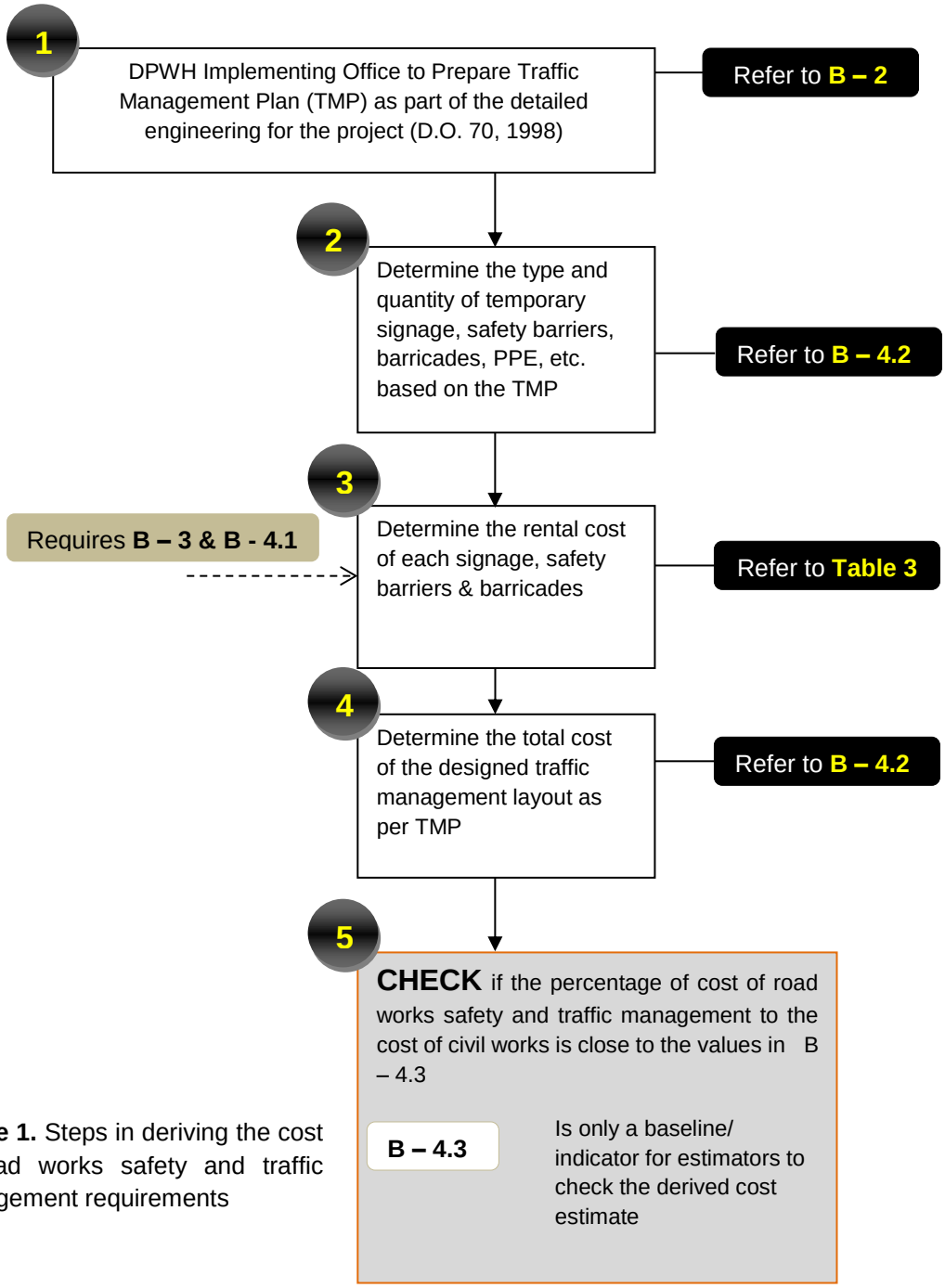


Figure 1. Steps in deriving the cost of road works safety and traffic management requirements

B – 2 Traffic Management Layouts

The **DPWH Road Works Safety Manual, 2004** includes discussion on the principles of worksite traffic management. For purposes of providing easy reference in this cost estimation guideline, presented herein are the worksite layout of signage and devices adopted from the DPWH Road Works Safety Manual (2004). However, a number of cases were observed in actual project implementation which also needs to be addressed thus, additional cases are introduced and some modifications are made on the layouts presented on the aforementioned manual.

The Traffic Management Layouts as presented in this guideline are still categorized into the following:

a. Short Term Works
b. Long Term Works
c. Detours and Side Tracks
d. Intersection Works
e. Pavement Marking Works

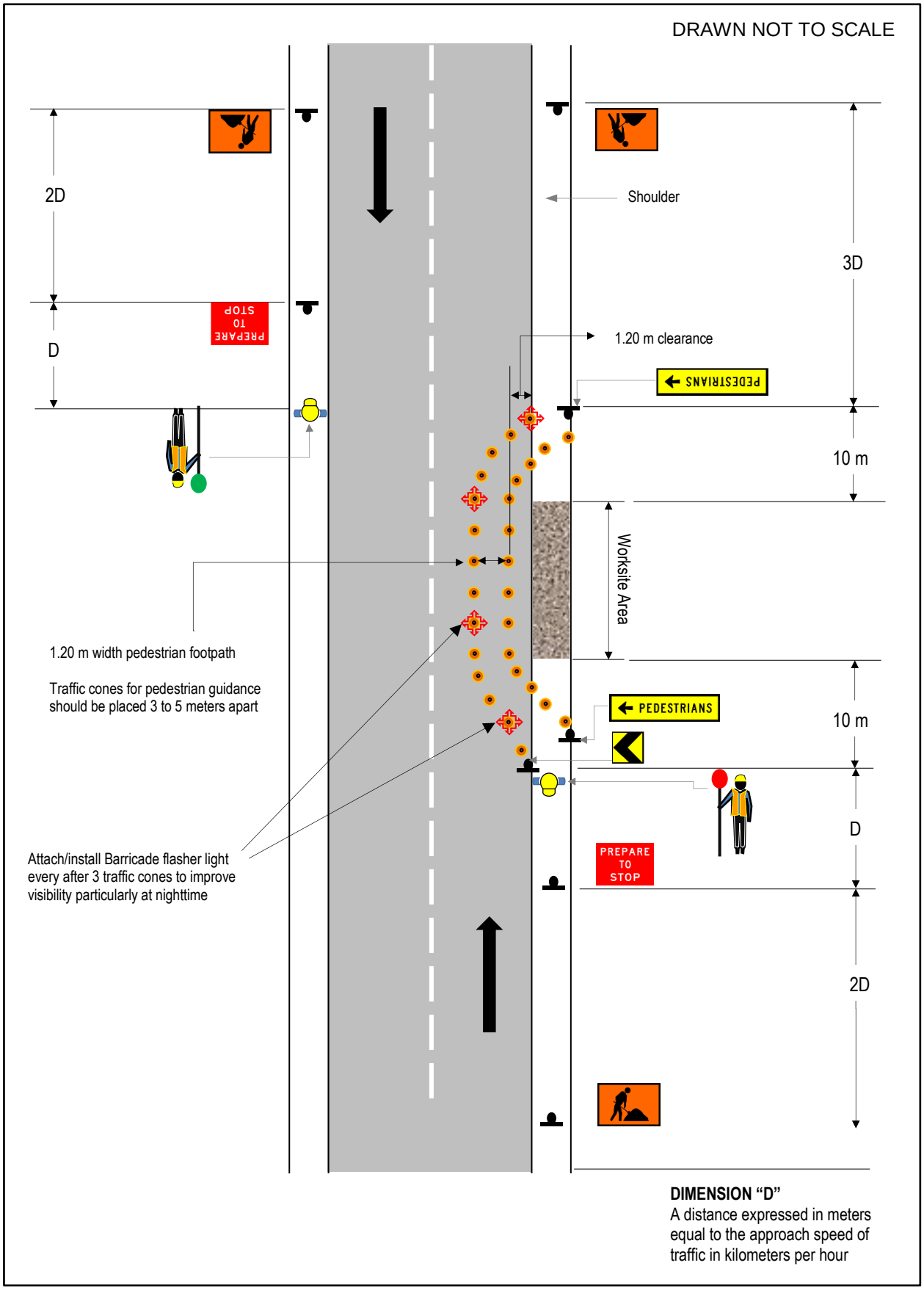
Through the illustrative traffic management layouts, the user of this guideline will be able to determine the basic requirements for the on-site implementation of road works safety and traffic management. Knowing such does not guarantee the sufficiency of knowledge in the proper practice of road works safety thus, a Traffic Management Plan (TMP) should be prepared by designated personnel in the office trained or have undergone seminar on the field of road works safety and traffic management. The traffic management layouts that would form part of the TMP to be prepared by the implementing office is not necessarily similar as presented in this guideline. Adjustments should be made to provide the necessary traffic control devices to be installed on site for a specific project. The need for a traffic controller is also illustrated on the different layouts and the requirement of providing a traffic controller for 24 hours on-site would depend on the actual operation and condition of the project. If closing a certain lane of the road hinders the continuous flow of a two-way traffic, then a traffic controller should be provided for the period that it is needed.

For purposes of illustrating the steps in deriving the cost, layouts in this guideline are utilized as basis in determining the quantities of signage and traffic devices.

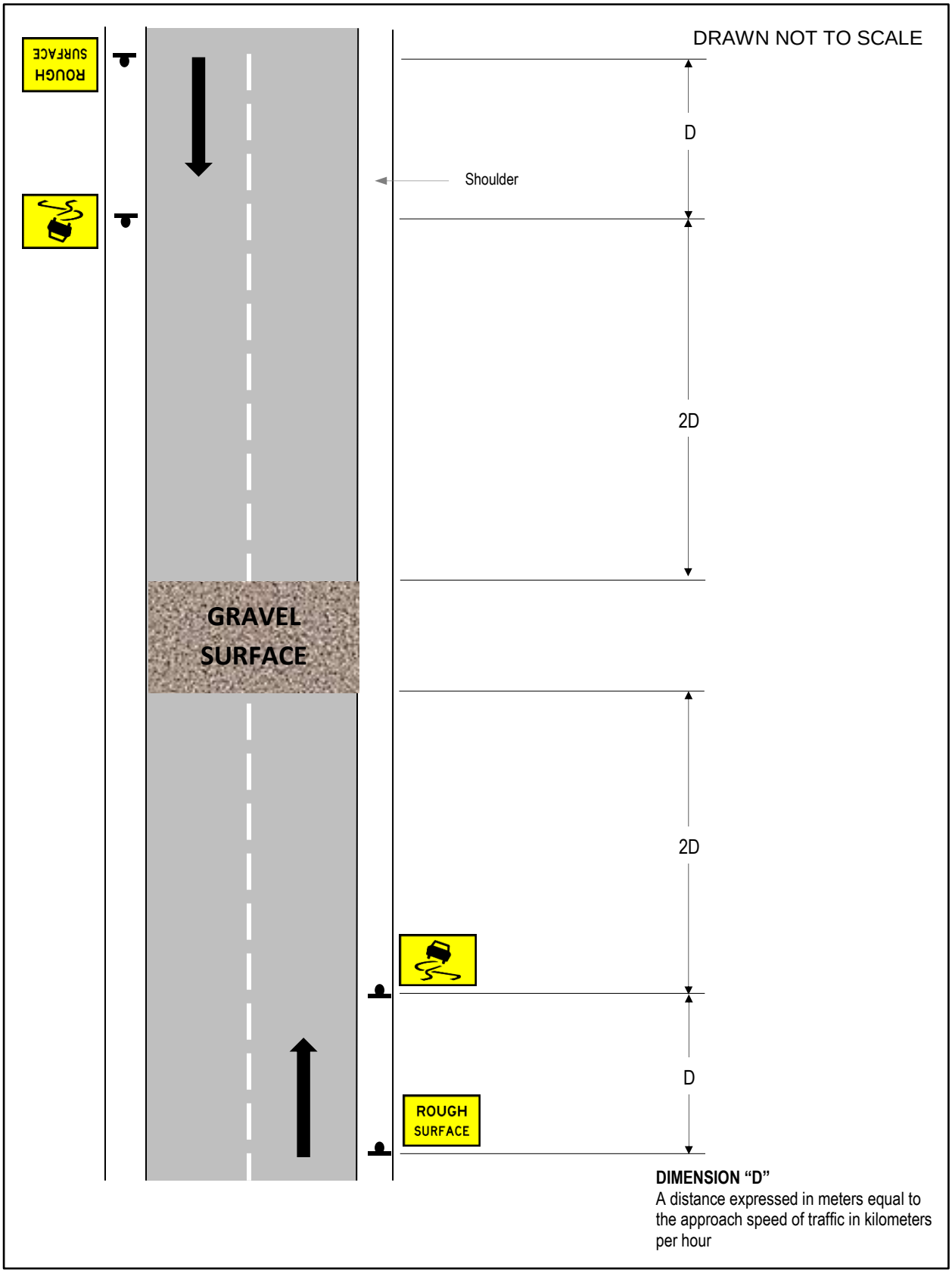
SHORT TERM WORKS

(TRAFFIC MANAGEMENT LAYOUTS)

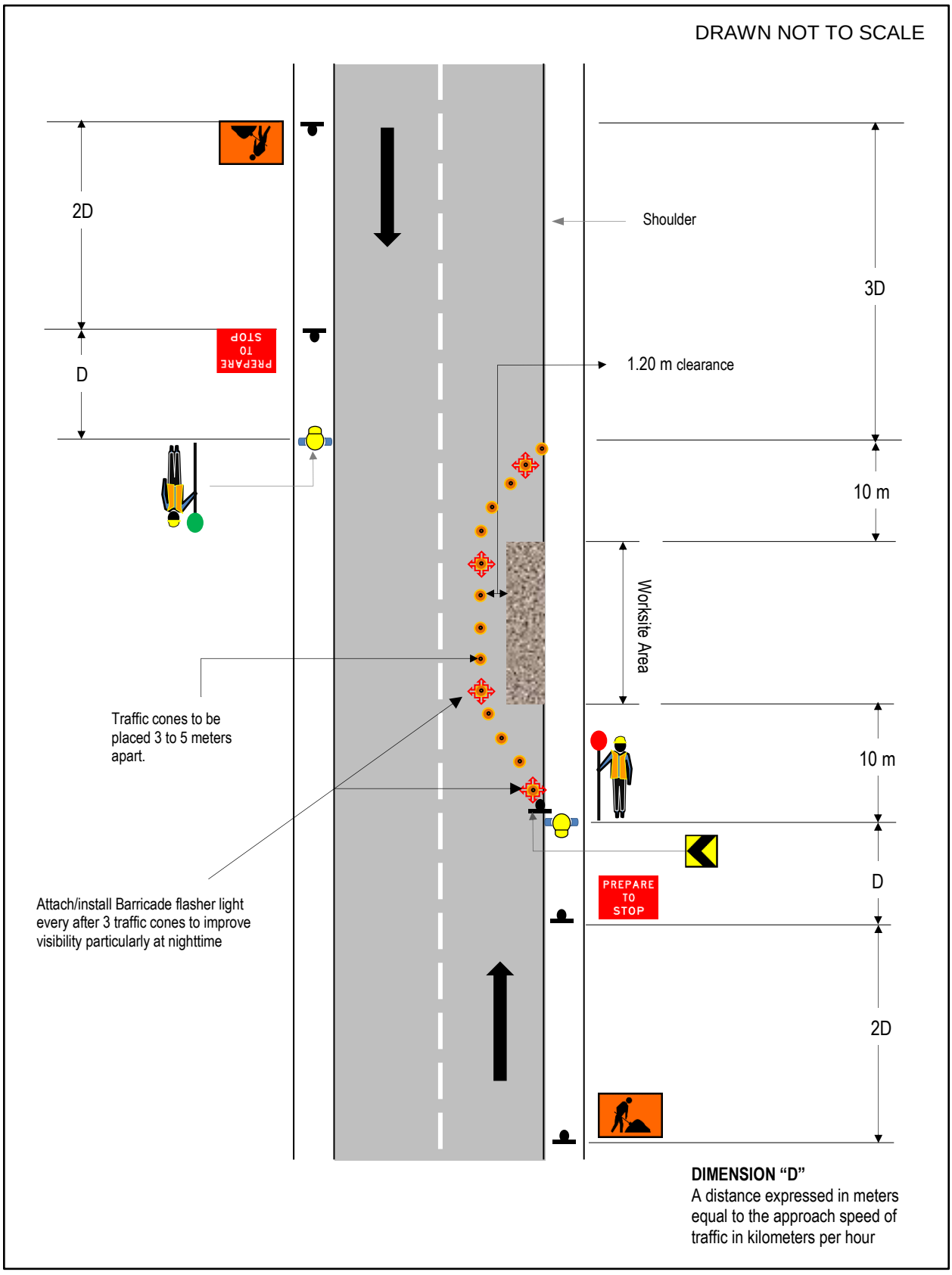
LAYOUT 1 – Part Lane Closure due to Works on Sidewalk – 2 Lane 2 Way Road, Low Speed, Short Term



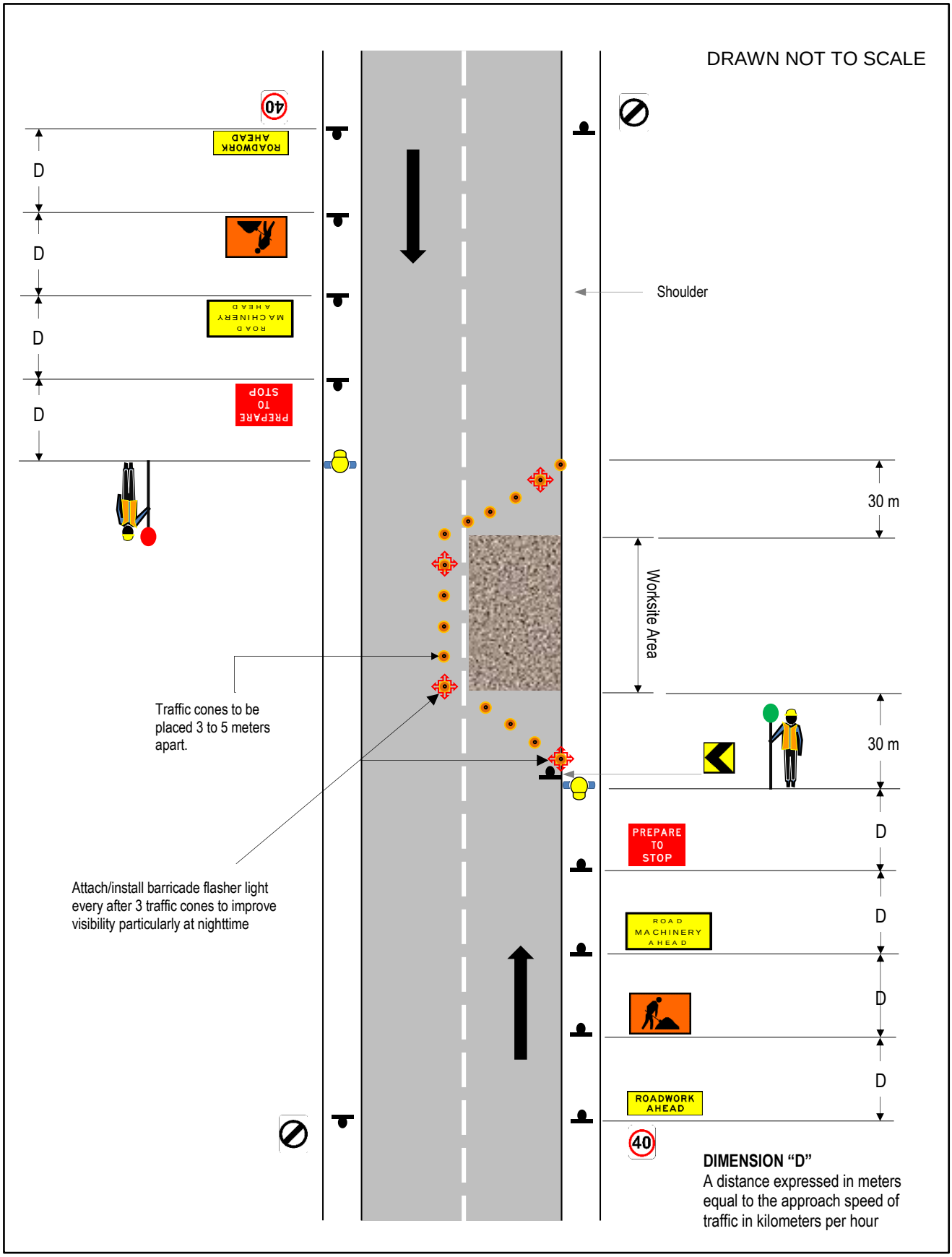
LAYOUT 2 – Road Condition Signing – Low Speed, Short Term



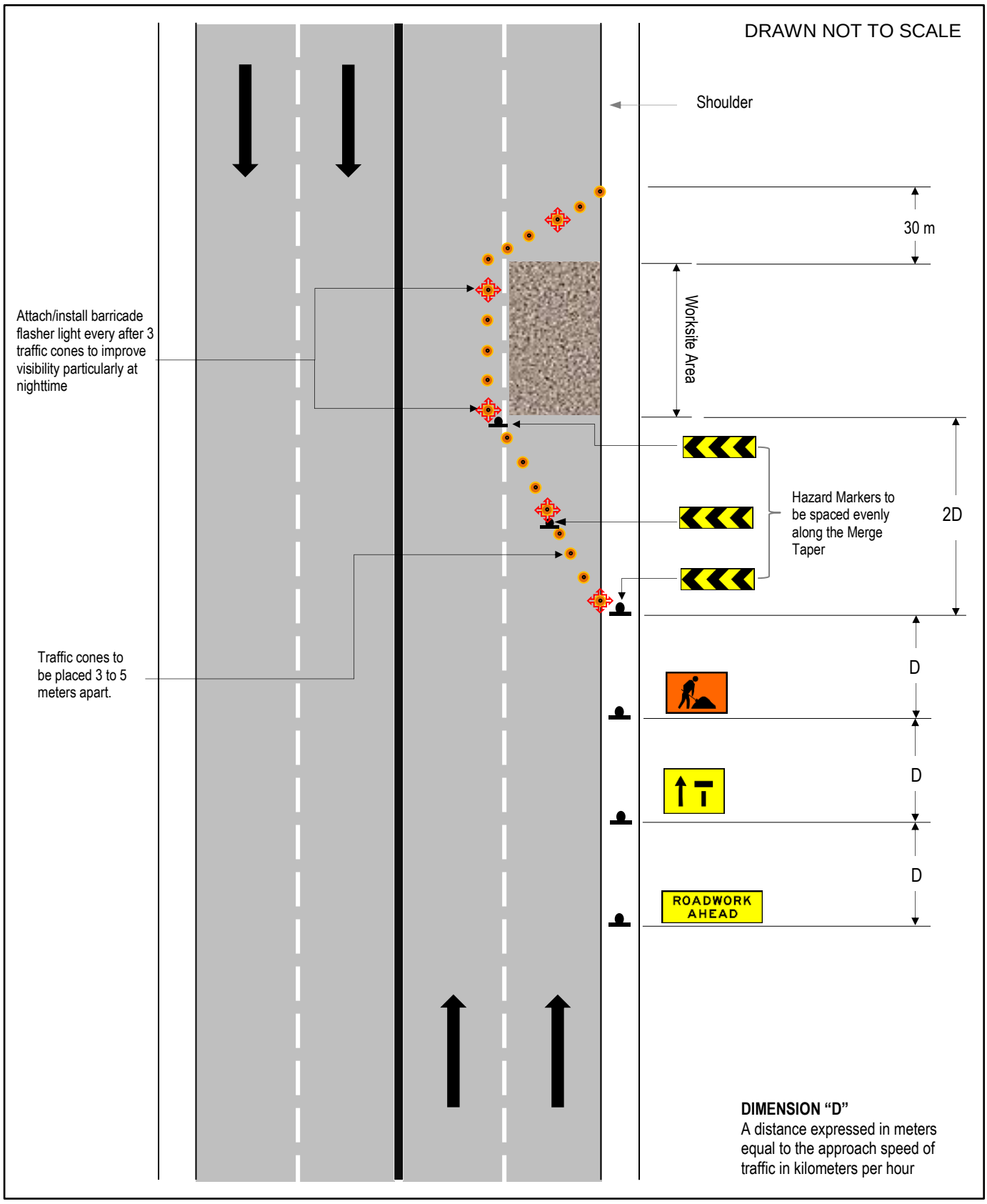
LAYOUT 3 – Part Lane Closure – 2 Lane, 2 Way Road, Low Speed, Low Volume, Short Term



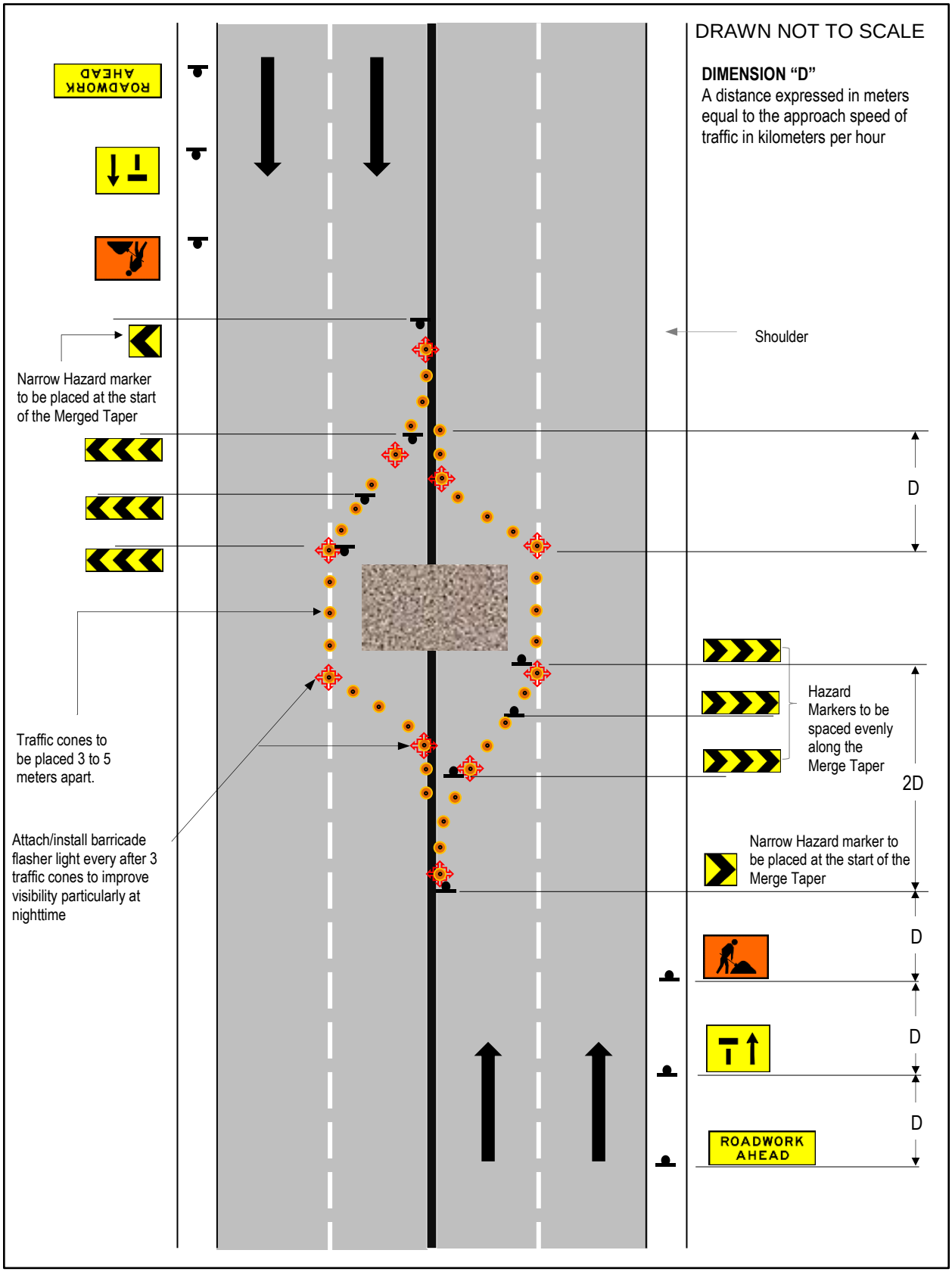
LAYOUT 4 – Part Lane Closure – 2 Lane, 2 Way Road, High Speed, Short Term



LAYOUT 5 – Closure of Outer Lane – Multilane Road, Low Speed, Short Term



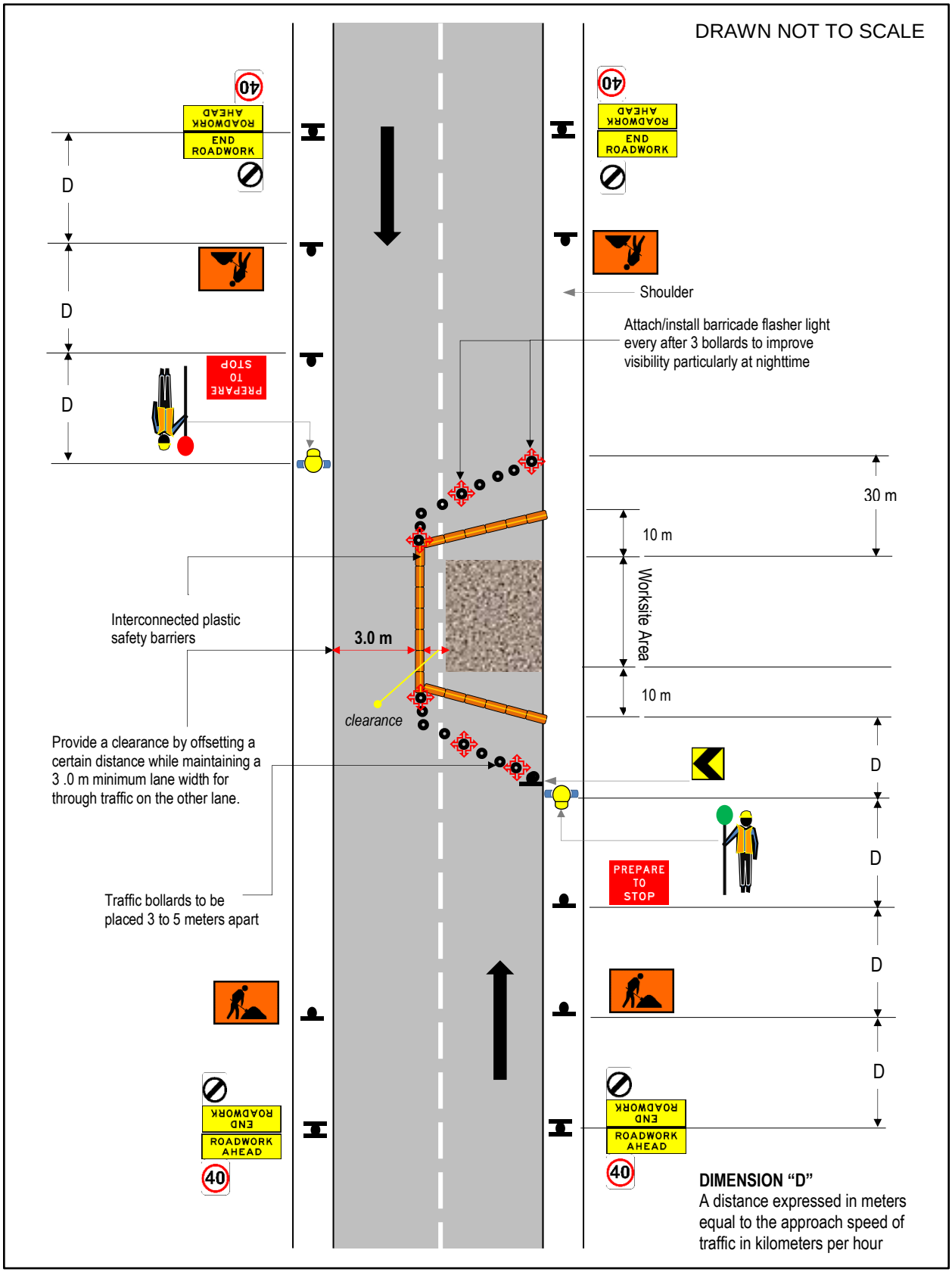
LAYOUT 6 – Closure of Center Lane – Multilane Road, Low Speed, Short Term



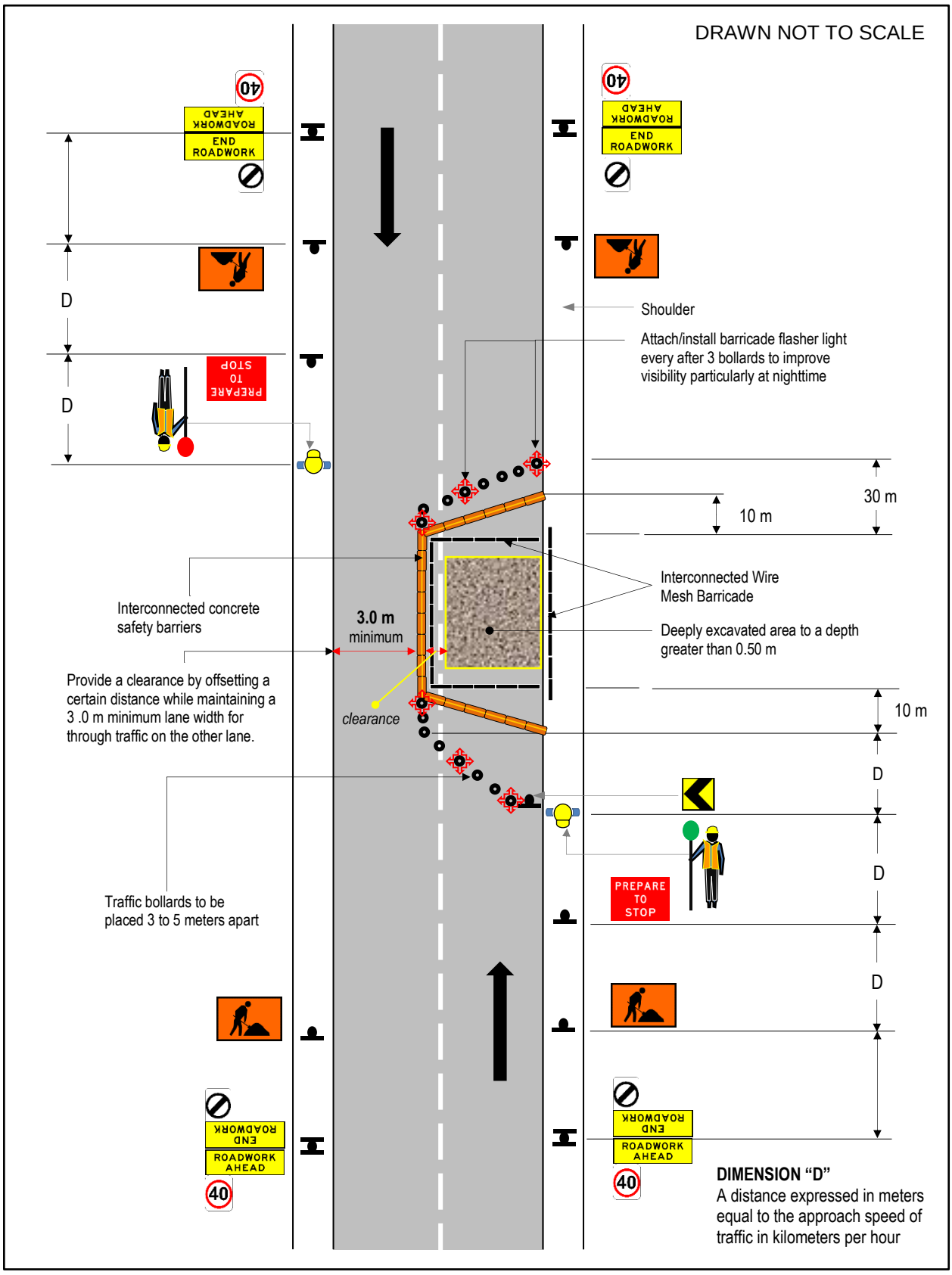
LONG TERM WORKS

(TRAFFIC MANAGEMENT LAYOUTS)

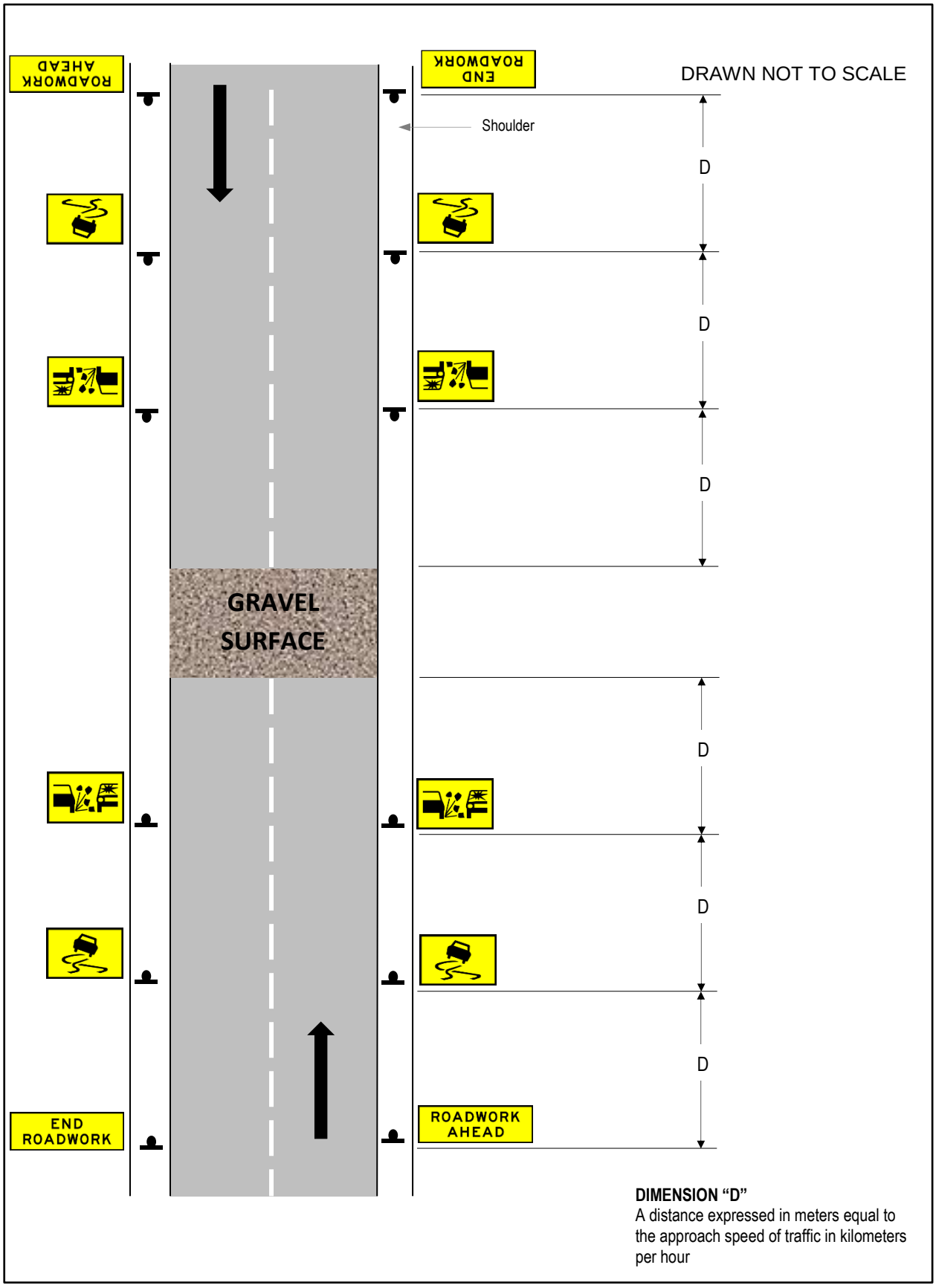
LAYOUT 7 (Case 1) – Part Lane Closure – 2 Lane, 2 Way Road, High Speed, Long Term



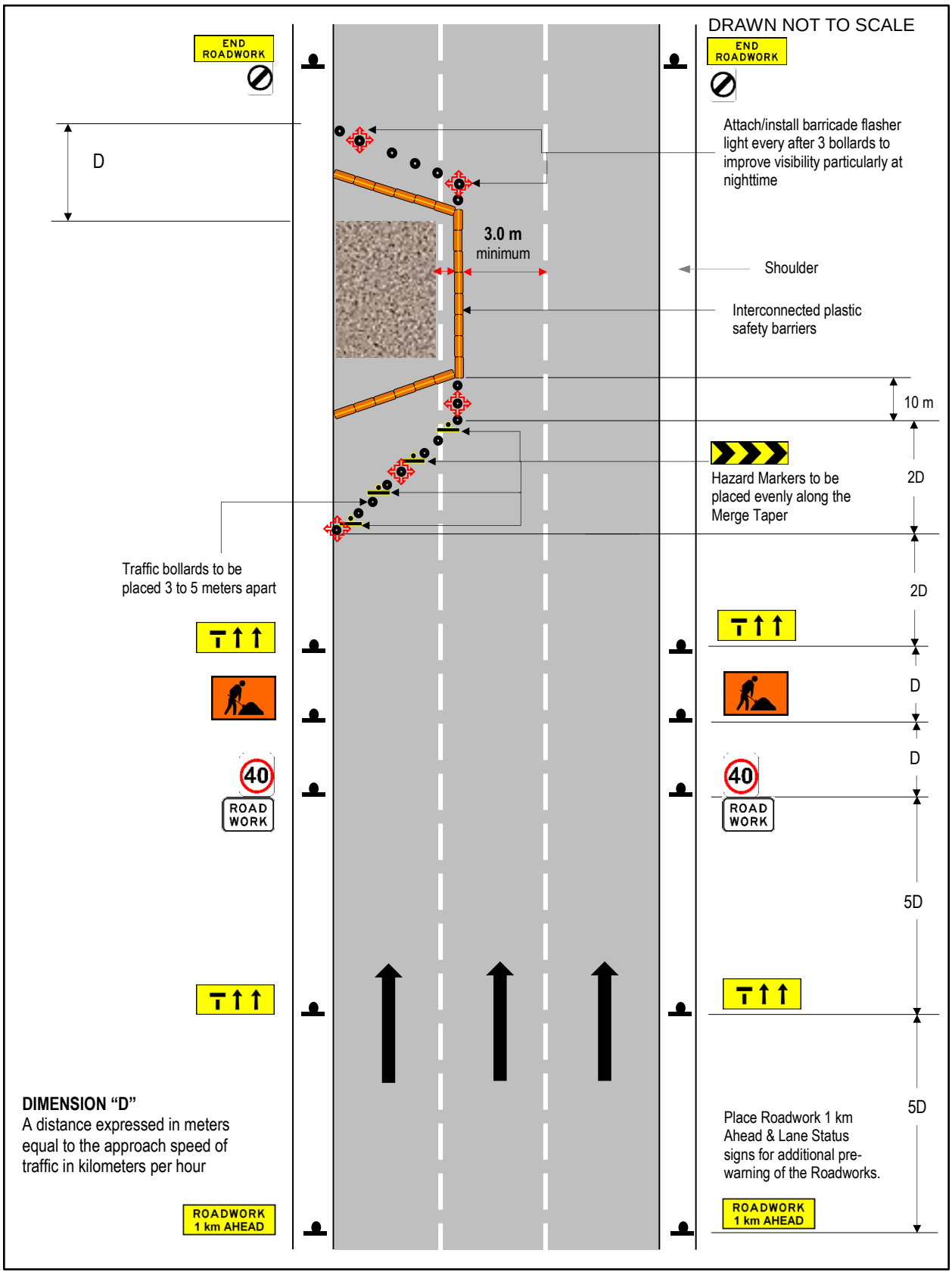
LAYOUT 7 (Case 2) – Part Lane Closure – 2 Lane, 2 Way Road, High Speed, Long Term (Works involving deep excavations)



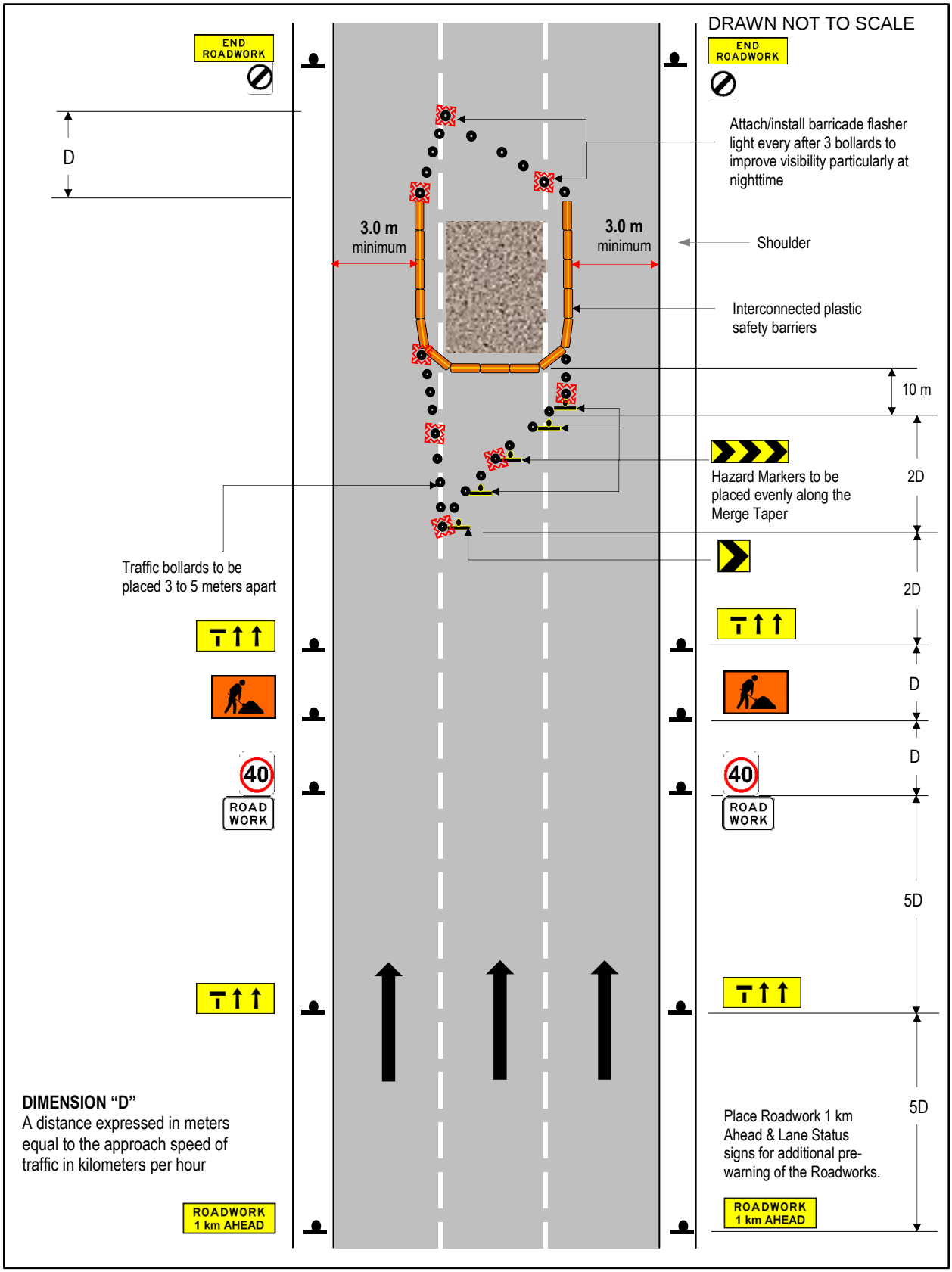
LAYOUT 8 – Road Condition Signing – High Speed, Long Term



LAYOUT 9 – Closure of Inner Lane – Multilane Road, High Speed, Long Term



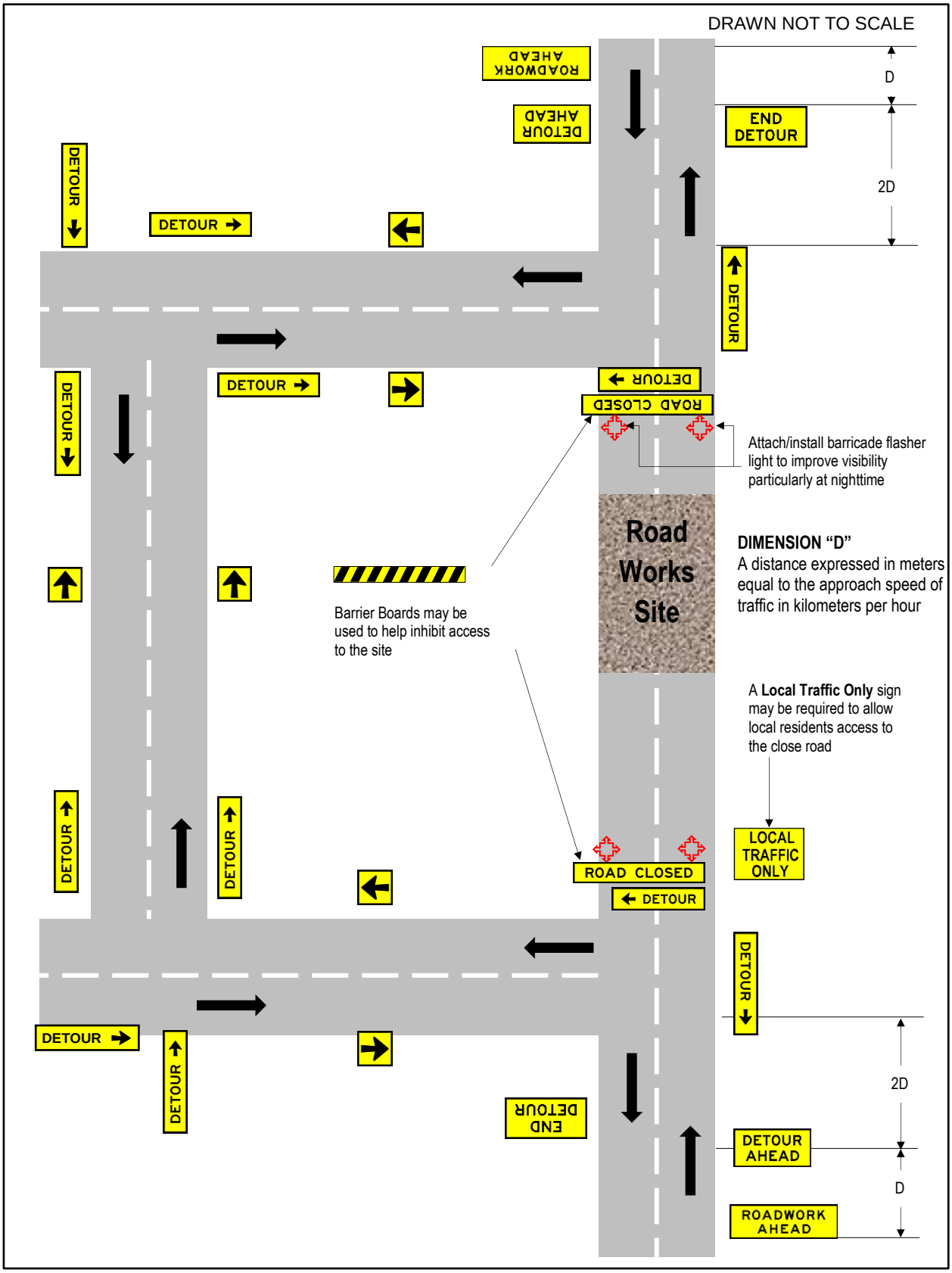
LAYOUT 10 – Closure of Center Lane – Multilane Road, High Speed, Long Term



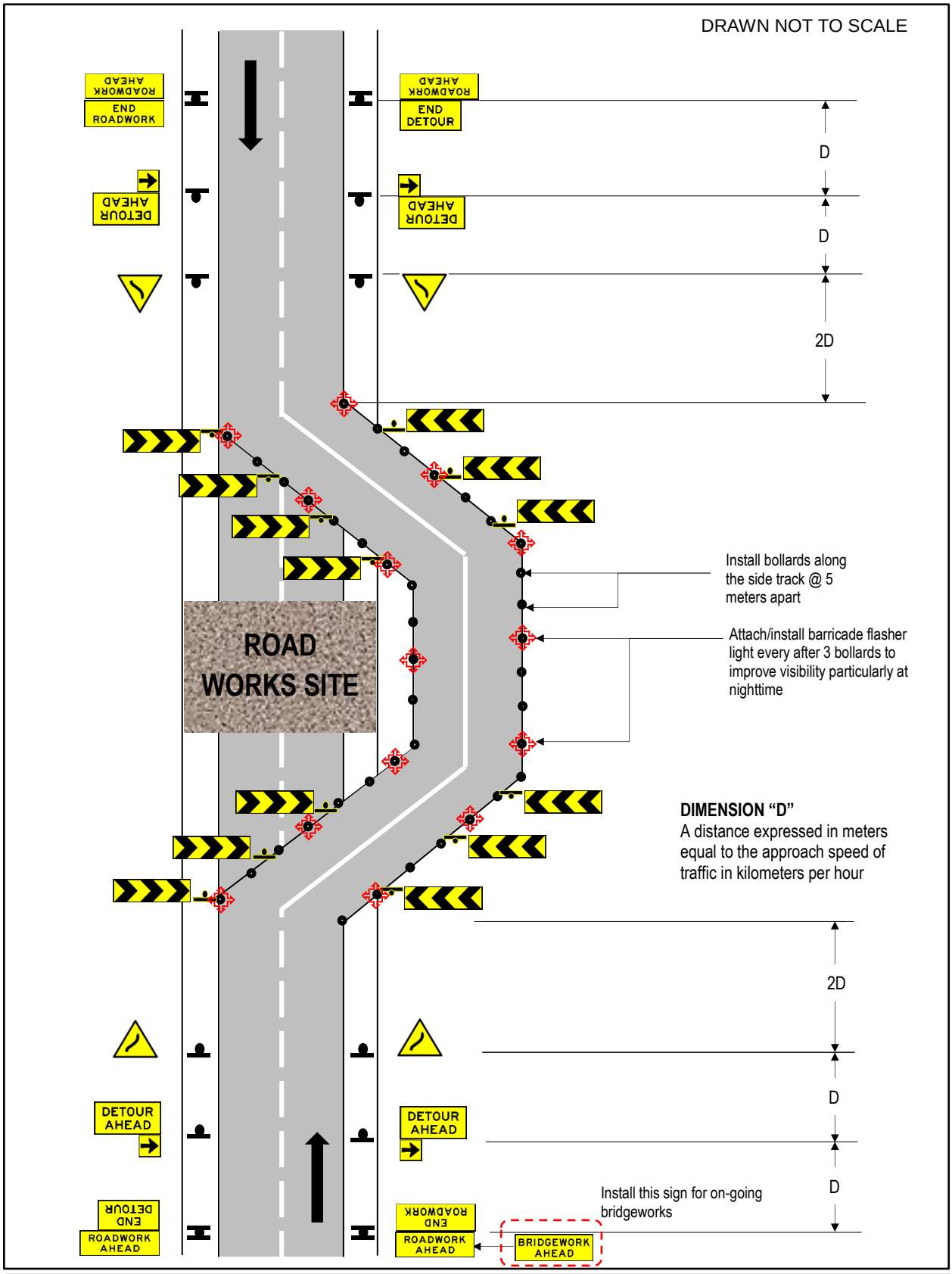
DETOURS AND SIDE TRACKS

(TRAFFIC MANAGEMENT LAYOUTS)

LAYOUT 11 – Detour via the Existing Road Network – Low or High Speed, Short or Long Term

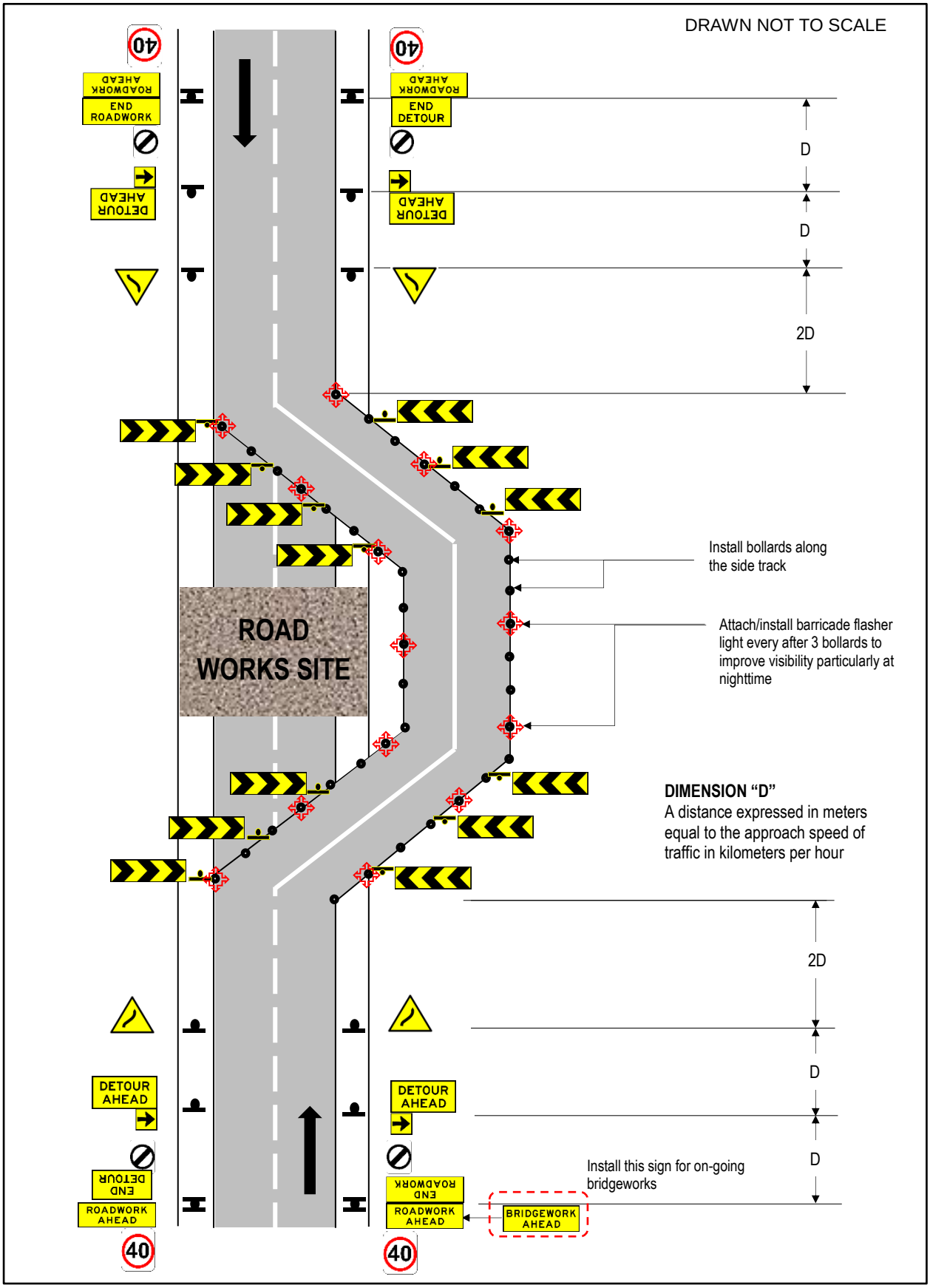


LAYOUT 12 – Detour via Side Track – Low Speed, Long Term



***NOTE**: This layout is also applicable for bridge works where provision of DETOUR/SIDE TRACK is necessary.*

LAYOUT 13 – Detour via Side Track – High Speed, Long Term

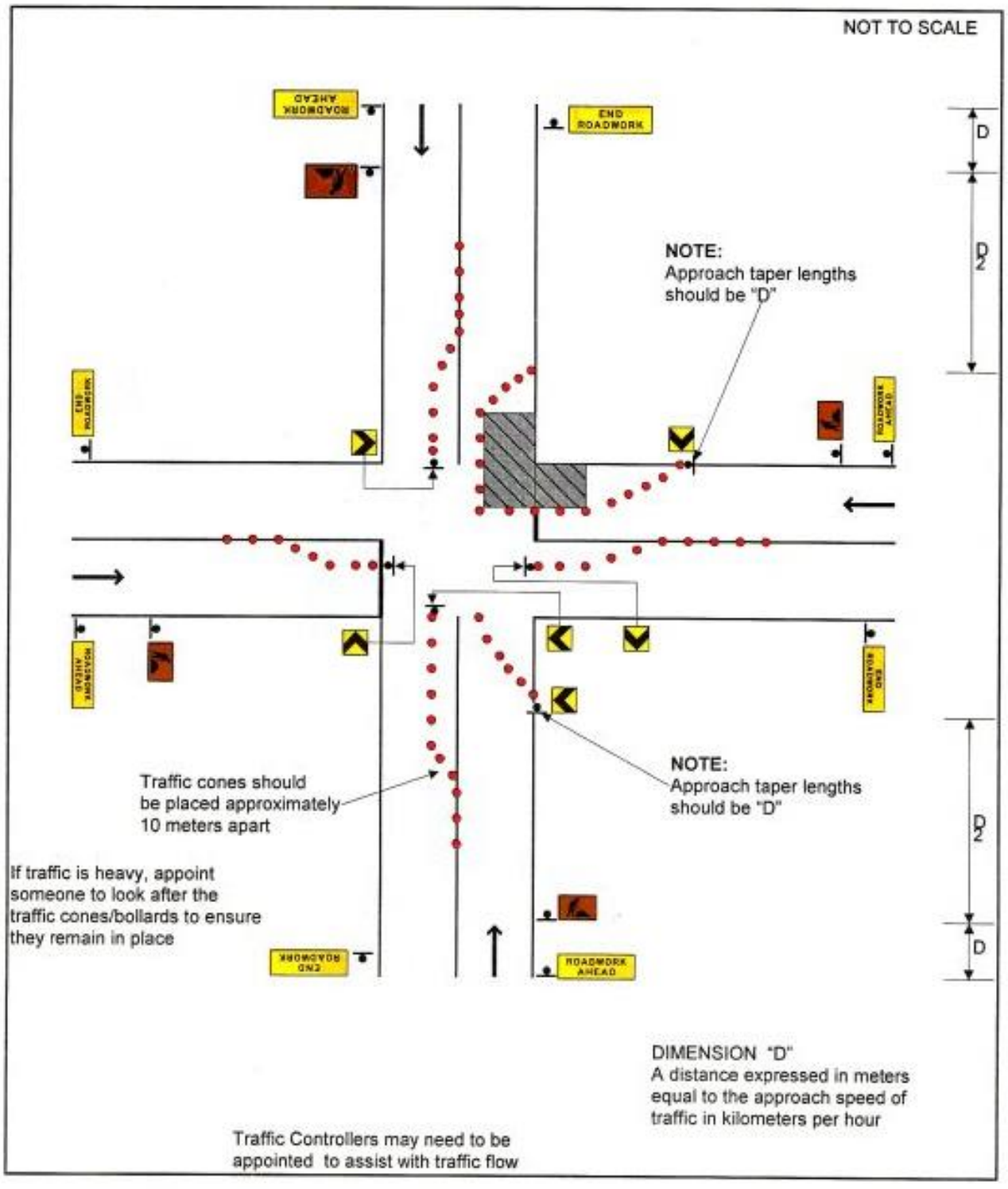


***NOTE**: This layout is also applicable for bridge works where provision of DETOUR/SIDE TRACK is necessary.*

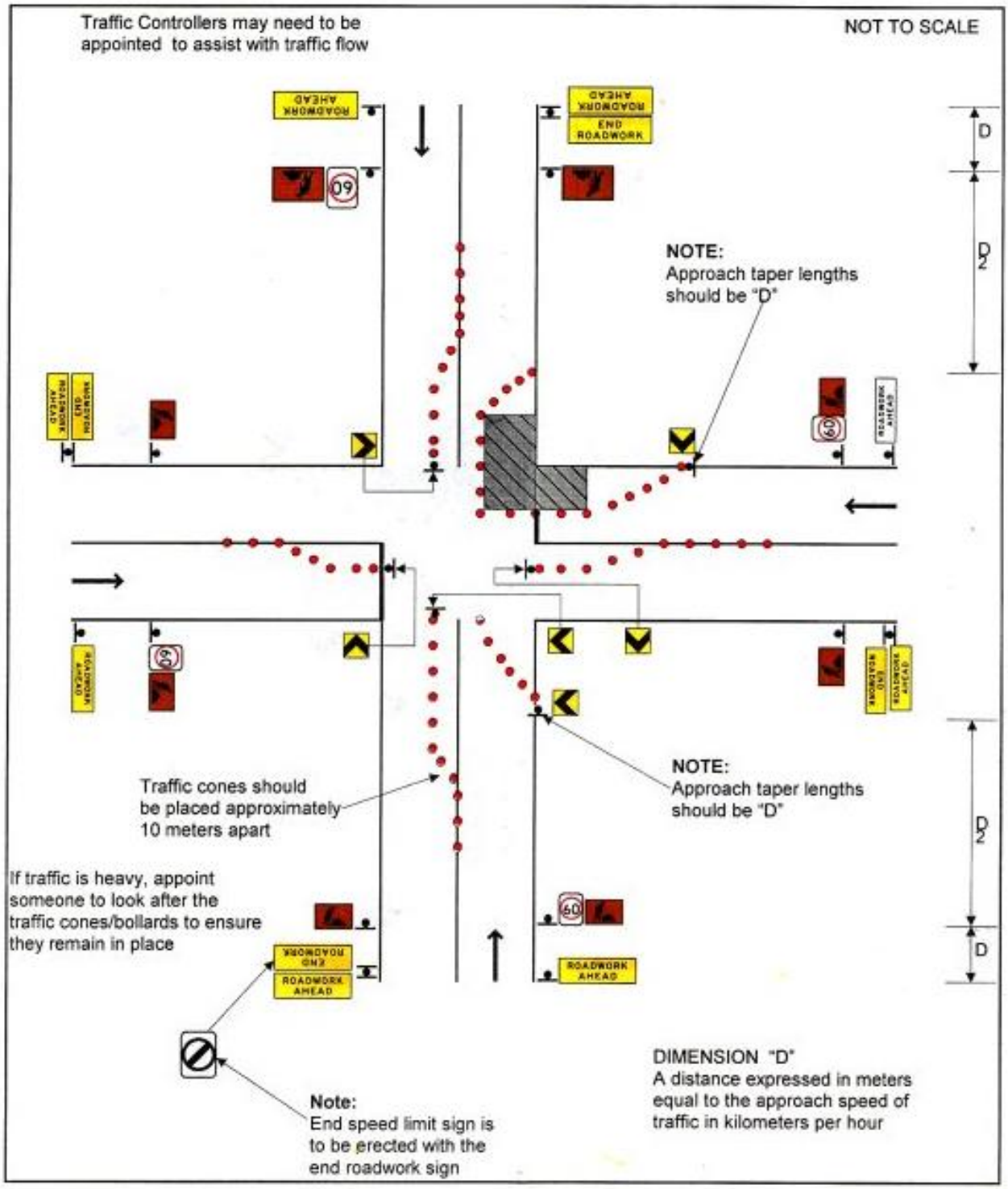
INTERSECTION WORKS

(TRAFFIC MANAGEMENT LAYOUTS)

LAYOUT 14 – Works at an Intersection - Low Speed, Short or Long Term



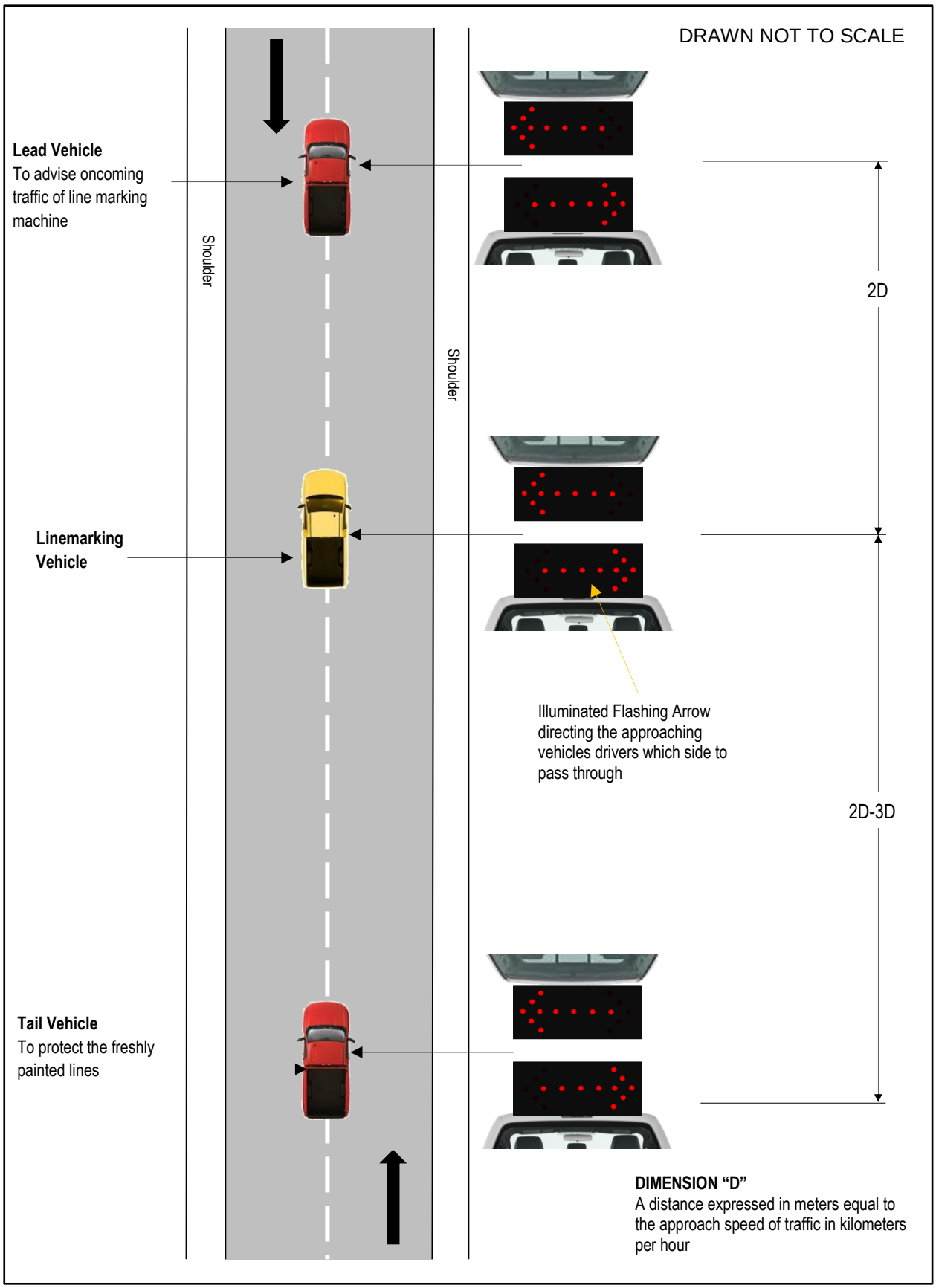
LAYOUT 15 – Works at an Intersection – High Speed, Short or Long Term



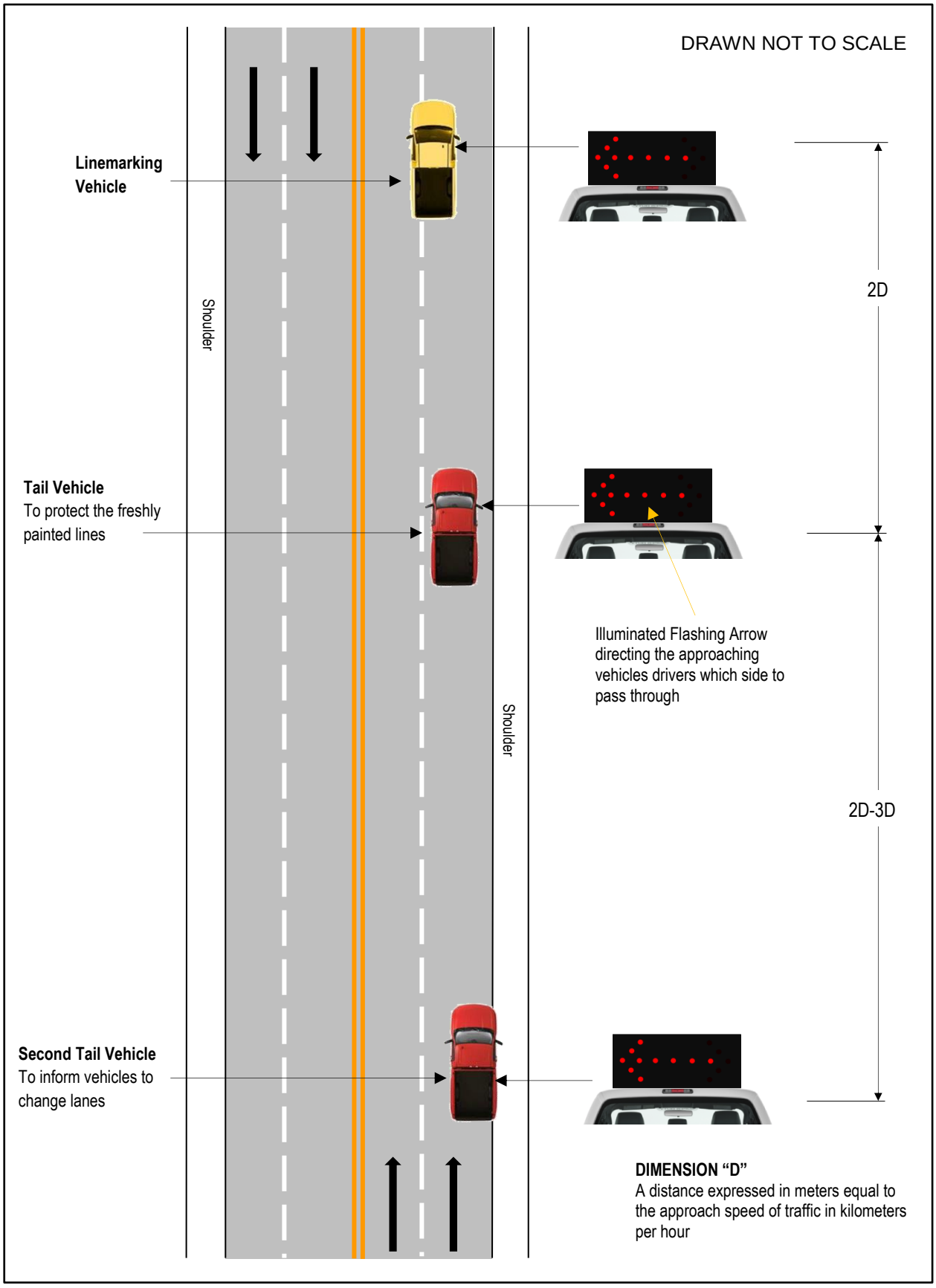
PAVEMENT MARKING WORKS

(TRAFFIC MANAGEMENT LAYOUTS)

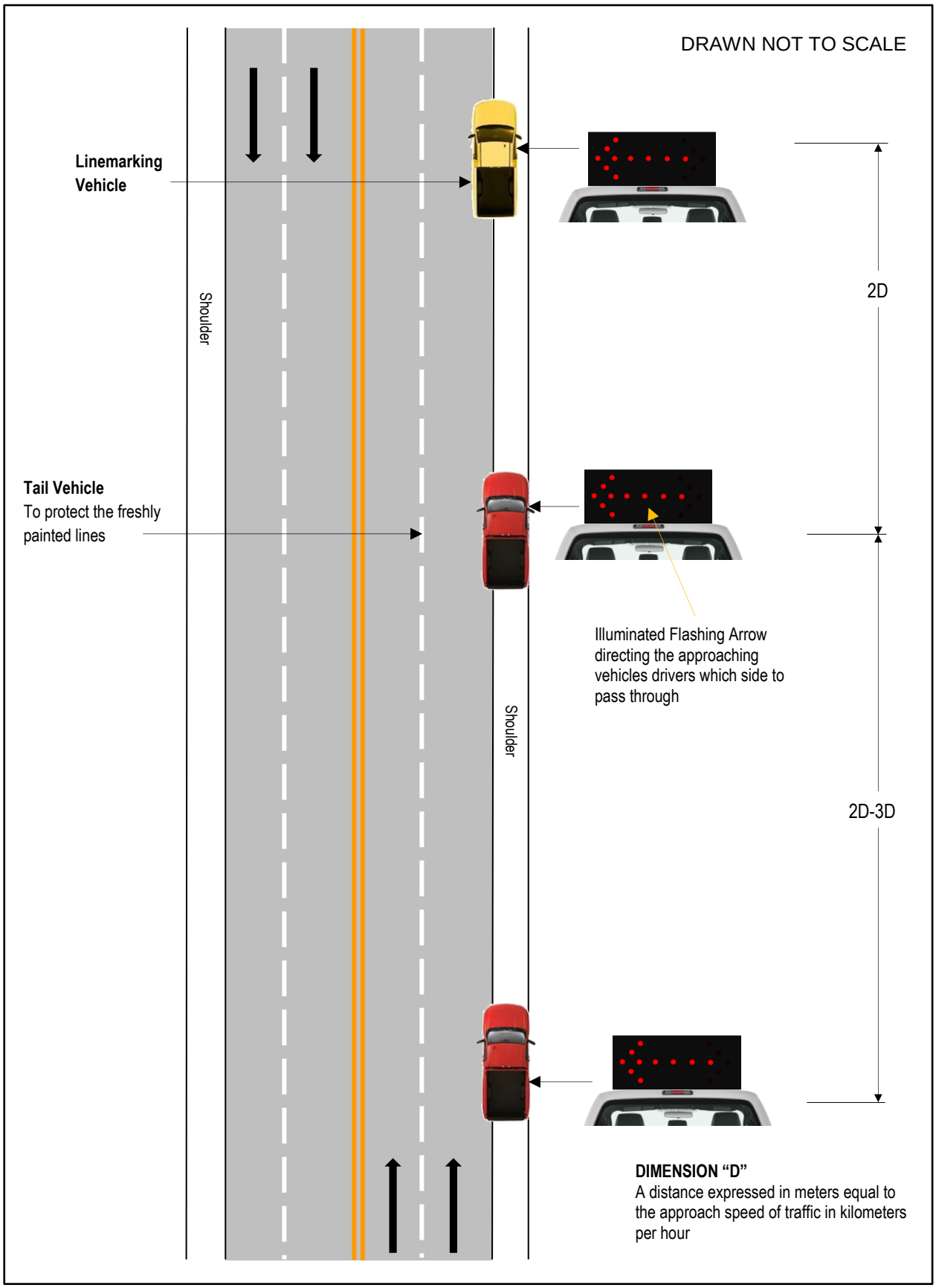
LAYOUT 16 – Lane Marking of Centerline – 2 Lane, 2 Way Road



LAYOUT 17 – Lane Marking of Centerline – Multilane Road



LAYOUT 18 – Lane Marking of Edgeline



Details on the color, standard sizes of signage, text layout and the requirement for luminosity/visibility of the signage, specification for other traffic control devices and relative standards are specified in the DPWH Road Works Safety Manual (2004). However, not all specifications of materials are stated in the said manual particularly the frame/support to be used for the temporary signage.

Based on DPWH Highway Safety Design Standards Part 2: Road Signs and Pavement Markings Manual, signs that are intended to convey message during dark periods need to be reflectorized or illuminated for greater visibility of colors and shapes. Reflectorization is achieved by the use of retro-reflective materials on legends, letter, borders and background of the sign. This requirement for reflectorization using a retro-reflective material is most advised for regular road signs as it would be for long term use and be fixed on our national highways. Similarly, for temporary road signs used in road works, standard specifications as advised shalll be adopted. For the frames to hold the sign panels, design is as presented below.

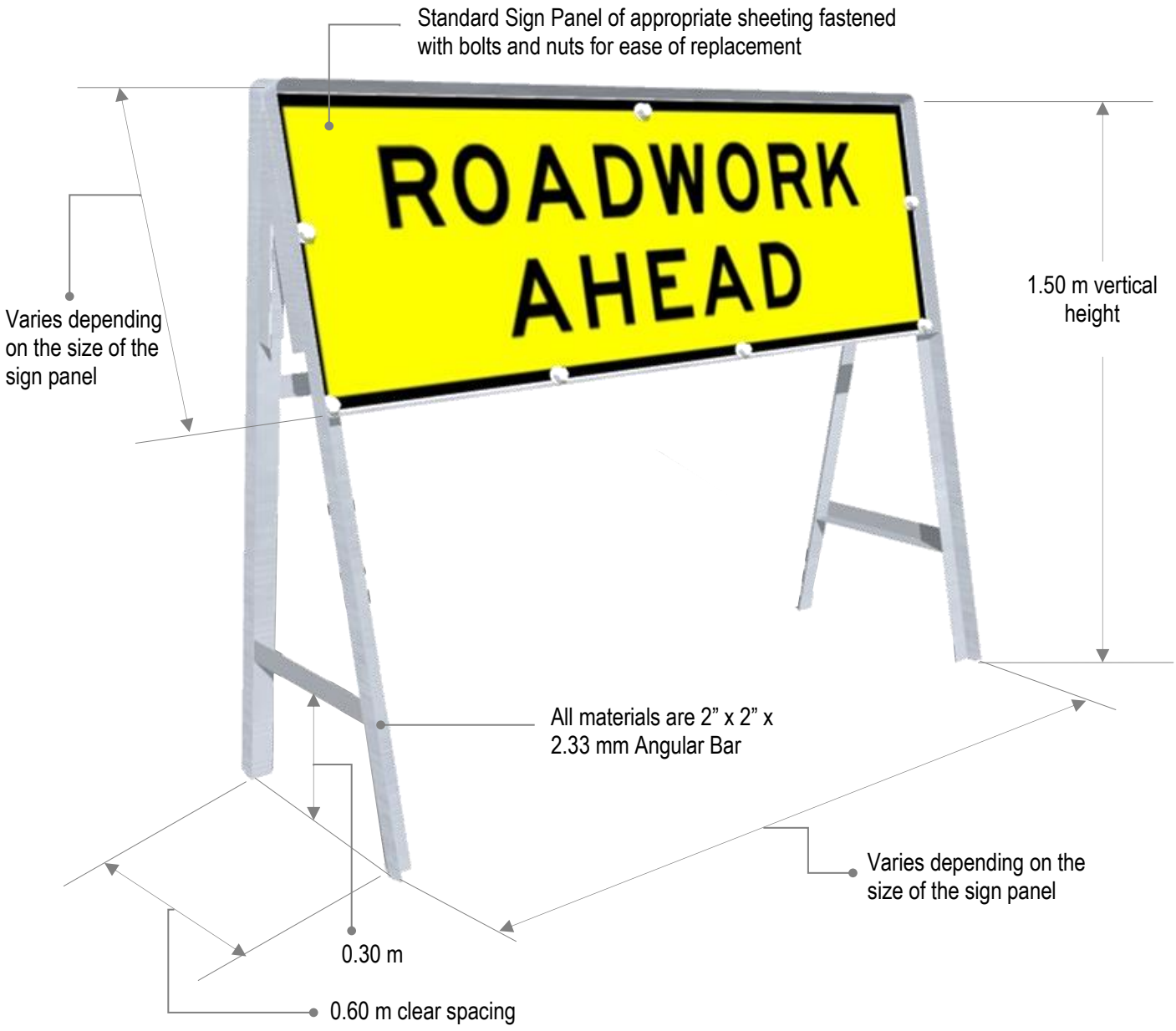


Figure 2. Details of the two-sided sign frame

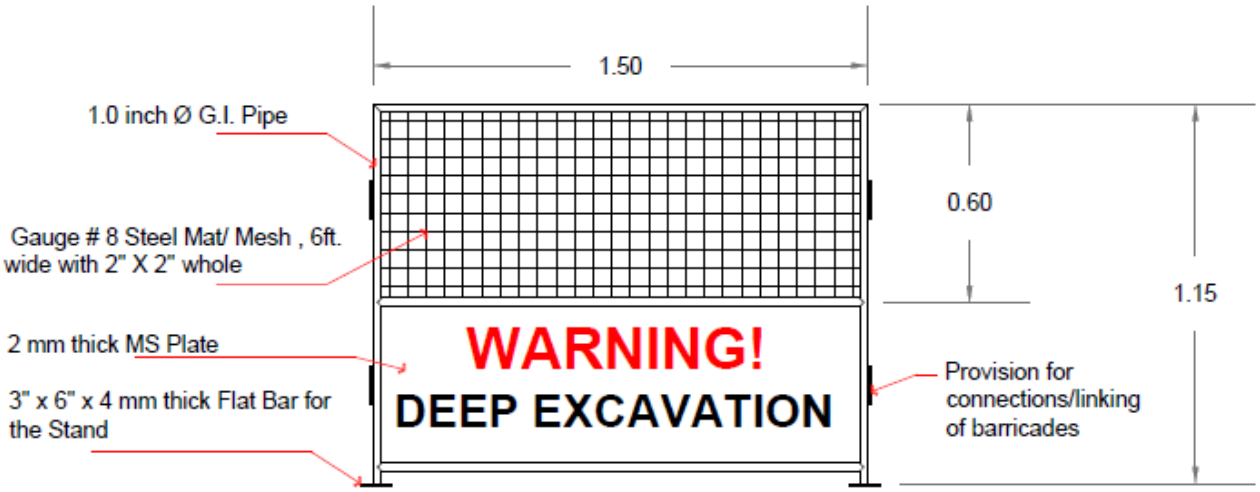
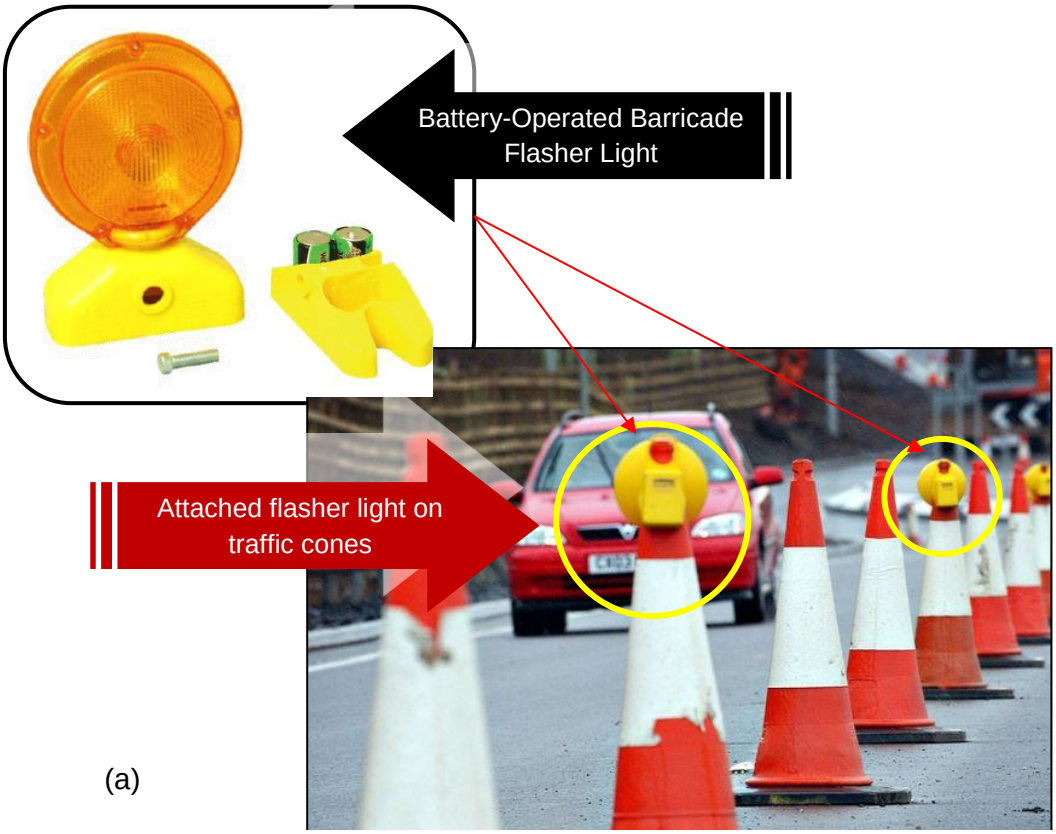


Figure 3. Details of construction mesh fence/barricade

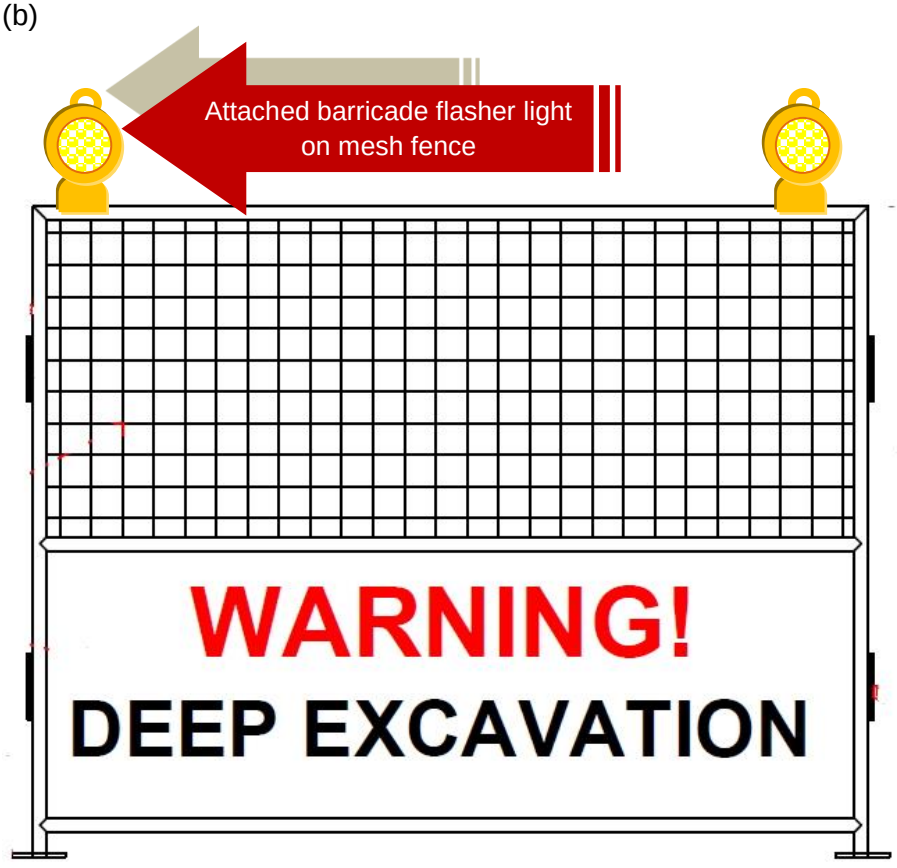
To further improve the visibility of onsite set-up road works traffic management signage and devices particularly during nighttime, LED flasher light or appropriate available retro-reflective material is suggested to be attached or separately mounted on the installed temporary bollards, traffic cones, safety barrier and mesh fence/barricade along the confined area (work zone).



(a)

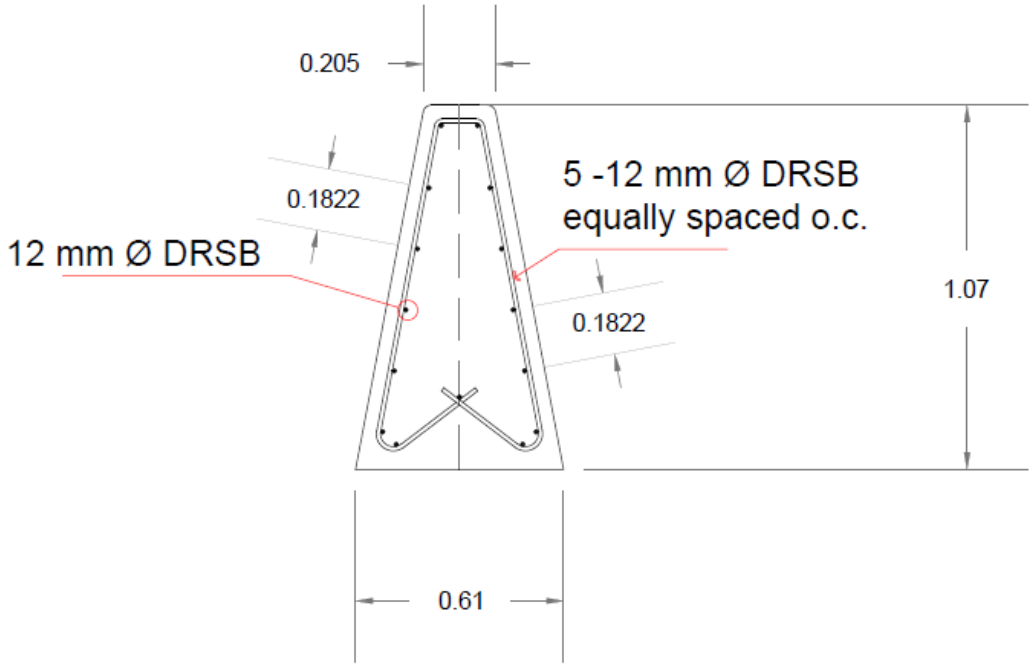
Source:
Retrieved from http://www.coventrytelegraph.net/news/coventry-news/12-weeks-new-roadworks-a45-8489038

(b)

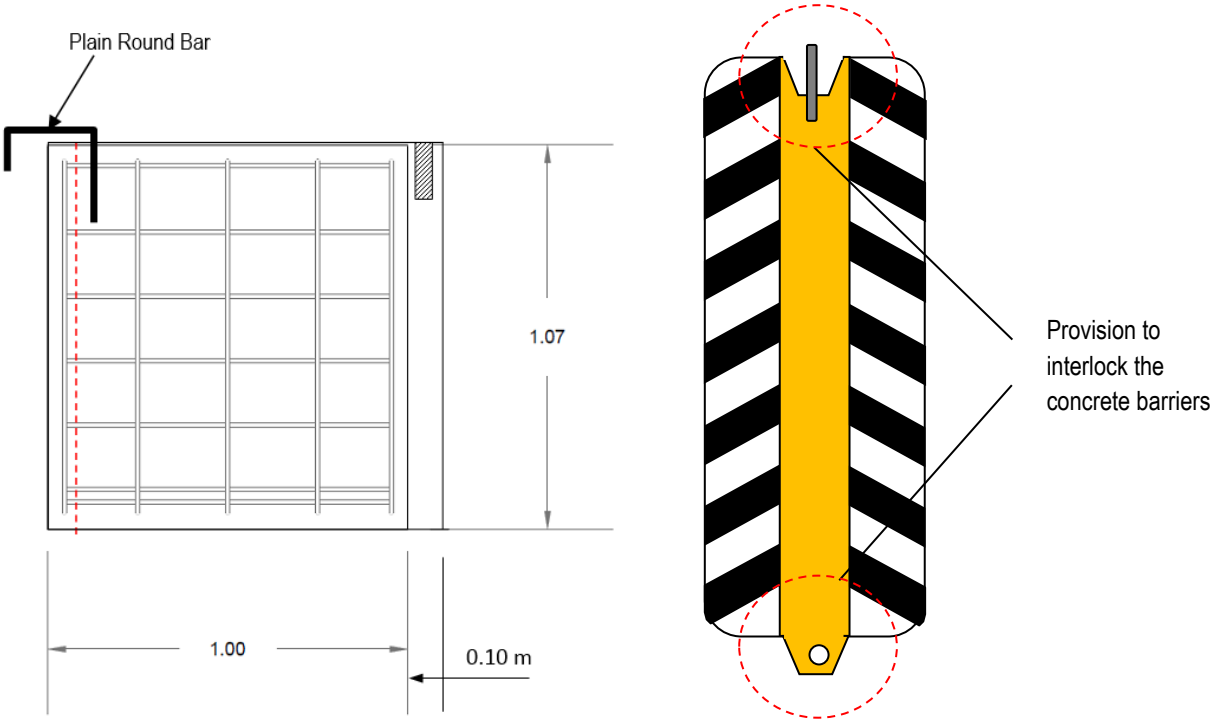


(c)

Figure 4. Installing or attaching of barricade flasher light on traffic devices (a) on traffic cones, (b) on temporary signage, (c) on barriers or fence



SECTION DETAILS



SIDE VIEW

Figure 5. Details of Concrete Barrier

B – 4 Cost Component

The cost for construction safety and health must be taken into consideration in the preparation of Program of Work (POW) for every project. **Section 8.1 of the Procedural Guidelines of DOLE D.O. 13, Series of 1998**- The Guidelines Governing Occupational Safety and Health in the Construction Industry states that the total cost of implementing a Construction Safety and Health Program shall be mandatory and shall be made an integral part of the project's construction cost as a separate pay item, duly quantified and reflected in the Project's Construction Contract Documents.

The road works safety wherein provision of traffic devices and signage are necessary to protect the workers and the road users from the probable harm of the on-going construction is considered in this guideline as covered by the abovementioned governing guidelines of DOLE. Hence, quantification and costing of those requirements are necessary.

Moreover, the DPWH D.O. 22, series of 2015 as superseded by D.O. 197, Series of 2016 presents that the cost of Construction Safety and Health is not embedded/incorporated in each civil work items thus, considered as a separate pay item under non-civil works but not subject to OCM mark-up. D.O. 05, Series of 2017 also specify Item B.7 – Occupational Safety and Health Program and B.8 Traffic Management as pay items under Part B – Other General Requirements.

B – 4.1 Considerations in the Preparation of DUPA

To illustrate the basic cost estimation process in this guideline, prepared herein is the Detailed Unit Price Analysis (DUPA) based on plans, specifications, and requirements presented in Section B - 2 to B - 3. The DUPA as presented in this guideline serve only as a reference for the implementing offices in deriving costs for the road works safety & traffic management and construction safety & health. Should there be an increase/decrease in cost, the Implementing Offices in its derivation of cost shall correspondingly make the necessary adjustments. Cost of Personal Protective Equipment (PPE) (e.g. safety shoes and gloves) will be based on the actual specific requirements and as prescribed in Table 1. It must be noted however, that the quantities of signs and traffic control devices in the DUPA presented in this guideline are not fixed as quantification should be based on the prepared worksite traffic management plan applicable for the specific project.

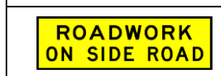
Table 3 tabulates the estimated unit cost for each road work signage and is utilized in the preparation of DUPA for each traffic management layout. With regard to costing, payment for the signage is in a daily rental basis which means that it will not be turned over to the implementing office after the completion of the project. The implementing office will only pay the contractor for providing the safety requirements within the period that the devices and signs are used in the project.

In the determination of the daily rental cost of the devices and signage, the following lifespan of materials are considered:

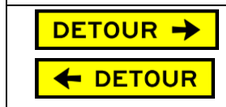
- Road works standard retroreflective signs – 3 years
- Plastic Safety Barriers – 2 years
- Traffic Cones – 2 years
- Temporary Bollards – 2 years
- Construction Safety Fence/Barricade – 2 years
- Concrete Safety Barriers – 5 years

For estimation and illustration purposes, sample DUPA of each traffic management layout presented herein are referred from the DPWH Construction Materials Price Data (CMPD 2015, NCR), DOLE Standard Labor Rates, D.O. 22, Series of 2015. The Implementing Offices shall adjust accordingly upon issuance of reference, guidelines and related policies that may supersede the stated references in this guideline.

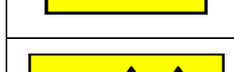
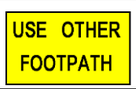
Table 3 – List of road works temporary signage and the estimated daily rental cost

ROAD AND BRIDGE WORK SITE TEMPORARY SIGNAGE		SIGNAGE DESCRIPTION				MATERIAL REQUIREMENTS AND COST						Daily Rental Rate (considering 3 years lifespan)
		Sign No.	Size (mm) (Width X Height)	Letters/Symbols	Background	Sign Panel	Frame		Consumables (5% of Frame)	Labor (15% of Frame & Consumables)	Total	
						[A]	Angle Bar	Cost [B]	[C]	[D]	[E] = [A] +[B] +[C] + [D]	[F] = [E]/(365*3)
ADVANCE WARNING SIGNS												
	***ROADWORK AHEAD*** (T1-1, T1-31)	T1-1	1800 x 600	Line 1- Black 200 DM Line 2- Black 160 DM	Yellow Reflectorized	₱7,733.00	3 pcs - 6m L50x50x3mm	₱1,929.24	₱96.46	₱303.86	₱11,991.80	10.95
	***BRIDGEWORK AHEAD*** (T1-2)	T1-2	1800 x 600	Line 1- Black 200 DM Line 2- Black 160 DM	Yellow Reflectorized	₱7,733.00	3 pcs - 6m L50x50x3mm	₱1,929.24	₱96.46	₱303.86	₱11,991.80	10.95
	***ROAD MACHINERY AHEAD*** (T1-3)	T1-3	1200 x 600	Line 1- Black 100 EM Line 2- Black 120 DM Line 3- Black 100 EM	Yellow Reflectorized	₱5,612.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱7,165.04	6.54
	***GRADER AHEAD*** (T1-4)	T1-4	900 x 600	Black 140 DN	Yellow Reflectorized	₱4,622.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***WORKMEN AHEAD (Symbolic)*** (T1-5)	T1-5	900 x 600	Black	Red / Orange -Fluorescent for day use (Short Term) -Reflectorized for night use (Long Term)	₱4,622.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***ROADWORK NEXT ... km*** (T1-24)	T1-24	1800 x 600	Line 1- Black 200 DM Line 2- Black 160 DM	Yellow Reflectorized	₱7,733.00	3 pcs - 6m L50x50x3mm	₱1,929.24	₱96.46	₱303.86	₱11,991.80	10.95
	***ROADWORK ON SIDE ROAD*** (T1-25)	T1-25	1800 x 600	Line 1- Black 160 EN Line 2- Black 160 DN	Yellow Reflectorized	₱7,733.00	3 pcs - 6m L50x50x3mm	₱1,929.24	₱96.46	₱303.86	₱11,991.80	10.95
	***NEXT 2 km*** (T1-28)	T1-28	600 x 600	Line 1- Black 150 DM Line 2- Black 150 DN & 100 LC	Yellow Reflectorized	₱3,470.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,309.20	5.76
	***END ROADWORK*** (T2-16, T2-17)	T2-16	1800 x 600	Line 1- Black 200 DM Line 2- Black 160 DM	Yellow Reflectorized	₱7,733.00	3 pcs- 6m L50x50x3mm	₱1,929.24	₱96.46	₱303.86	₱11,991.80	10.95
REGULATORY SIGNS												
	***PREPARE TO STOP*** (T1-18)	T1-18	900 x 600	Line 1- White 120 DM Line 2- White 120 DM Line 3- White 120 EM Reflectorized	Red Reflectorized	₱4,622.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***SPEED RESTRICTION*** (R4-1)	R4-1	600 x 800 (size B)	Black 240 DN Circle – 600 dia. Red	White Reflectorized Red circle - Reflectorized	₱3,622.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱5,175.04	4.73
	***ROAD WORK*** (R4-3)	R4-3	600 x 400 (size B)	Line 1- Black 100 EM Line 2- Black 100 EM	White Reflectorized	₱2,685.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱4,238.04	3.87
	***END SPEED RESTRICTION*** (R4-12, R4-2)	R4-12	600 x 1000 (size B)	Line 1 - Black 160 EM Line 2 - Black 240 DN Circle – 600 dia. Red	White Reflectorized Red circle - Reflectorized	₱4,528.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,081.04	5.55

Note: Refer to B-4.1 for the guidelines in determining the cost of material requirements.

ROAD AND BRIDGE WORK SITE TEMPORARY SIGNAGE		SIGNAGE DESCRIPTION				MATERIAL REQUIREMENTS AND COST						Daily Rental Rate (considering 3 years lifespan)
		Sign No.	Size (mm) (Width X Height)	Letters/Symbols	Background	Sign Panel	Frame		Consumables (5% of Frame)	Labor (15% of Frame & Consumables)	Total	
						[A]	Angle Bar	Cost [B]	[C]	[D]	[E] = [A] +[B] +[C] + [D]	[F] = [E]/(365*3)
	***END SPEED RESTRICTION*** (R4-12, R4-2) De-restriction	R4-2	600 x 800 (size B)	Symbol – 600 dia. Black	White Reflectorized	₱3,622.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱5,175.04	4.73
DETOUR SIGNS												
	***DETOUR AHEAD*** (T1-6)	T1-6	1200 x 600	Line 1- Black 160 EN Line 2- Black 160 EN	Yellow Reflectorized	₱5,612.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱7,165.04	6.54
	***DETOUR (Left or Right)*** (T5-1)	T5-1	1200 X 300	Black 120 EN	Yellow Reflectorized	₱3,698.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱5,251.04	4.80
	***DETOUR MARKER*** (T5-6)	T5-6A	450 X 450	Black 300 High	Yellow Reflectorized	₱2,012.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱3,565.04	3.26
	***LOCAL TRAFFIC ONLY*** (G9-40-2)	G9-40-2	900 x 600	Line 1- Black 100 EN Line 2- Black 100 EN Line 3- Black 100 EN	Yellow Reflectorized	₱4,622.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***END DETOUR*** (T2-23)	T2-23	1200 x 600	Line 1- Black 160 DM Line 2- Black 160 DM	Yellow Reflectorized	₱5,612.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱7,165.04	6.54
SIGNS FOR ROAD CONDITIONS & HAZARDS												
	***WET TAR*** (T3-1)	T3-1	900 x 600 Type B-2	Line 1- Black 160 FM Line 2- Black 160 FM	Yellow Reflectorized	₱4,622.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***SLIPPERY*** (T3-3)	T3-3	900 x 600 Type B-2	Symbol - Black	Yellow Reflectorized	₱4,622.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***SOFT EDGES*** (T3-6)	T3-6	900 x 600 Type B-2	Line 1- Black 160 DN Line 2- Black 160 DN	Yellow Reflectorized	₱4,622.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***ROUGH SURFACE*** (T3-7)	T3-7	900 x 600 Type B-2	Line 1 - Black 120 EN Line 2 - Black 120 DN	Yellow Reflectorized	₱4,622.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***LOOSE STONES*** (T3-9)	T3-9	900 x 600 Type B-2	Symbol - Black	Yellow Reflectorized	₱4,622.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***GRAVEL ROAD*** (T3-13)	T3-13	900 x 600 Type B-2	Line 1 - Black 140 DN Line 2 - Black 140 DN	Yellow Reflectorized	₱4,622.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***LOOSE SURFACE*** (T3-14)	T3-14	900 x 600 Type B-2	Line 1 - Black 140 DM Line 2 - Black 140 CM	Yellow Reflectorized	₱4,622.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
	***NO LINES DO NOT OVERTAKE UNLESS SAFE*** (T3-12)	T3-12	1500 x 900 Type B-1	Line 1 - Black 140 EM Line 2 - Black 140 EM Line 3 - Black 140 EM Line 4 - Black 120 DM	Yellow Reflectorized	₱9,575.00	3 pcs- 6m L50x50x3mm	₱1,929.24	₱96.46	₱303.86	₱11,904.56	10.87

NOTE: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in cost of materials, necessary adjustments shall be made accordingly.

ROAD AND BRIDGE WORK SITE TEMPORARY SIGNAGE		SIGNAGE DESCRIPTION				MATERIAL REQUIREMENTS AND COST						Daily Rental Rate (considering 3 years lifespan)
		Sign No.	Size (mm) (Width X Height)	Letters/Symbols	Background	Sign Panel	Frame		Consumables (5% of Frame)	Labor (15% of Frame & Consumables)	Total	
						[A]	Angle Bar	Cost [B]	[C]	[D]	[E] = [A] +[B] +[C] + [D]	[F] = [E]/(365*3)
	***TRAFFIC HAZARD AHEAD*** (T1-10)	T1-10	1200 x 900	Line 1 - Black 160 DM Line 2 - Black 160 DM Line 2 - Black 160 DM	Yellow Reflectorized	₱8,150.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱9,703.04	8.86
			Type A-2									
	***TRUCKS ENTERING*** (T2-25)	T2-25	900 x 600	Symbol Black	Yellow Reflectorized	₱4,622.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
			Type B-2									
SIGNS FOR LANE & ROAD CLOSURES												
	***ROAD CLOSED*** (T2-4)	T2-4	1800 X 300	Black 140 EN	Yellow Reflectorized	₱3,745.00	3 pcs - 6m L50x50x3mm	₱1,929.24	₱96.46	₱303.86	₱6,074.56	5.55
			Type C-1									
	***LANE STATUS*** (T2-6-1 and T2-6-2)	T2-6-1	1200 x 900	Black 600 High	Yellow Reflectorized	₱8,150.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱9,703.04	8.86
			Type A-2									
	***LANE STATUS*** (T2-6-1 and T2-6-2)	T2-6-2	1800 x 900	Black 600 High	Yellow Reflectorized	₱11,850.00	3 pcs - 6m L50x50x3mm	₱1,929.24	₱96.46	₱303.86	₱14,179.56	12.95
			Type A-1									
SIGNS FOR PEDESTRIAN CONTROL												
	***PEDESTRIANS WATCH YOUR STEP*** (T8-1)	T8-1	900 x 600	Line 1 - Black 100 CN Line 2 - Black 100 CN Line 3 - Black 100 CN	Yellow Reflectorized	₱4,622.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
			Type B-2									
	***PEDESTRIANS*** (T8-2 L or R)	T8-2 L or R	1200 X 300	Black 100 CM Arrow 140	Yellow Reflectorized	₱3,698.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱5,251.04	4.80
			Type C-2									
	***USE OTHER FOOTPATH*** (T8-3)	T8-3	900 x 600	Line 1- Black 100 DN Line 2- Black 100 DN	Yellow Reflectorized	₱4,622.00	2 pcs - 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,175.04	5.64
			Type B-2									
TEMPORARY HAZARD MARKERS												
	***TEMPORARY HAZARD MARKER*** (T5-5)	T5-5	600 x 600	Chevrons Black 194 wide at 45°	Yellow Reflectorized	₱3,470.00	2 pcs- 6m L50x50x3mm	₱1,286.16	₱64.31	₱202.57	₱6,309.20	5.76
			Type B-3									
	***TEMPORARY HAZARD MARKER*** (T5-4)	T5-4	1500 x 450	Chevrons Black 177 wide at 45°	Yellow Reflectorized	₱6,440.00	3 pcs- 6m L50x50x3mm	₱1,929.24	₱96.46	₱303.86	₱8,769.56	8.01
			Type B-1									

NOTE: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in cost of materials, necessary adjustments shall be made accordingly.

Detailed Unit Price Analysis (DUPA) per Traffic Management Layout

B – 4.2

Detailed Unit Price Analysis

(Layout 1- Part Lane Closure due to Works on Sidewalk - 2 Lane, 2 Way Road, Low Speed, Short Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Prepare to Stop	each	2.00	5.64	11.28
Workmen Ahead (T1-5)	each	3.00	5.64	16.92
Temporary Hazard marker (Chevron, T5-5)	each	1.00	5.76	5.76
Pedestrians (T8-2 L or R)	each	2.00	4.80	9.59
* Traffic Cones (@ 3 meters apart) = *Unit Price of a Traffic Cone/ Lifespan (2 years)*	each	24.00	1.85	44.38
Safety Vest	each	2.00	2.22	4.44
Safety Helmet	each	2.00	0.25	0.49
Safety Shoes	each	2.00	2.77	5.55
* *Quantity is based on the assumed 9 -meter length (2 blocks) of road work zone If the length is increased/decreased, corresponding adjustment of quantities shall be made.*				
Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.				
SUB - TOTAL (A)				**98.42**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
Unskilled Workers	2.00	2.00	70.74	282.96
Traffic Controller (Flagman)	2.00	8.00	70.74	1,131.84
SUB - TOTAL (B)				**1,414.80**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
Stake Truck (5 T)	1.00	2.00	712.00	1,424.00
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	6.00	8.00	0.65	31.27
SUB - TOTAL (C)				**1,455.27**

1 day is equivalent to 8 hrs

Sample Computation:

$$\frac{₱\,938.05\ (cost\ of\ 1\ flasher\ light)}{(30\ days\ X\ 6)\ X\ 8\ hours} = ₱\,0.65\ \text{rental/ hour}$$

Multiplying 0.65 by 8 hrs is just equivalent to the daily rental rate of ₱5.21. So, 5.21 X 6 units = 31.27.

D.	TOTAL DIRECT COST (A + B + C)		2,968.49
E.	DIRECT UNIT COST (D/Quantity)		2,968.49
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	237.48	
	3. VAT 12%	384.72	
**	TOTAL INDIRECT COST		622.19
	TOTAL COST (D + F)		3,590.68
	TOTAL RENTAL COST		3,590.68

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 2 - Road Condition Signing - Low Speed, Short Term)

ITEMS NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Rough Surface (T3-7)	each	2.00	5.64	11.28
Slippery (T3-3)	each	2.00	5.64	11.28
Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.				
SUB - TOTAL (A)				**22.56**

B. LABOR COST	QUANTITY		Unit Rate	Total Cost
	No. of Personnel	Total Hours		
SUB - TOTAL (B)				**-**

C. EQUIPMENT COST	QUANTITY		Hourly Rate	Total Cost
	No. of Equipt.	Total Hours		
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		22.56
E.	DIRECT UNIT COST (D/Quantity)		22.56
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	1.80	
	3. VAT 12%	2.92	
**	TOTAL INDIRECT COST		4.73
	TOTAL COST (D + F))		27.29
	TOTAL RENTAL COST		27.29

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 3 - Part Lane Closure - 2 Lane 2 Way Road, Low Speed, Low Volume, Short Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Prepare to Stop	each	2.00	5.64	11.28
Workmen Ahead (T1-5)	each	2.00	5.64	11.28
Temporary Hazard Marker (Chevron, T5-5)	each	1.00	5.76	5.76
* Traffic Cones (@ 5 meters apart)	each	16.00	1.85	29.59
Safety Vest	each	2.00	2.22	4.44
Safety Helmet	each	2.00	0.25	0.49
Safety Shoes	each	2.00	2.77	5.55
* *Quantity is based on the assumed 50-meter length roadwork zone If the length is increased/decreased, corresponding adjustment of quantities shall be made.*				
Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.				
SUB - TOTAL (A)				**68.39**

B. LABOR COST	QUANTITY		Unit Rate	Total Cost
	No. of Personnel	Total Hours		
Unskilled Workers	2.00	2.00	70.74	282.96
Traffic Controller (Flagman)	2.00	8.00	70.74	1,131.84
SUB - TOTAL (B)				**1,414.80**

C. EQUIPMENT COST	QUANTITY		Hourly Rate	Total Cost
	No. of Equipt.	Total Hours		
Stake Truck (5 T)	1.00	2.00	712.00	1,424.00
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	4.00	8.00	0.65	20.85
SUB - TOTAL (C)				**1,444.85**

D.	TOTAL DIRECT COST (A + B + C)		2,928.04
E.	DIRECT UNIT COST (D/Quantity)		2,928.04
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	234.24	
	3. VAT 12%	379.47	
**	TOTAL INDIRECT COST		613.72
	TOTAL COST (D + F)		3,541.75
	TOTAL RENTAL COST		3,541.75

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 4- Part Lane Closure - 2 Lane 2 Way Road, High Speed, Short Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Speed Restriction (R4-1)	each	2.00	4.73	9.45
Roadwork Ahead (T1-1)	each	2.00	10.95	21.90
End Speed Restriction (R4-2)	each	2.00	4.73	9.45
Workmen Ahead (T1-5)	each	2.00	5.64	11.28
Road Machinery (T1-3)	each	2.00	6.54	13.09
Prepare to Stop (T1-18)	each	2.00	5.64	11.28
Temporary Hazard Marker (Chevron, T5-5)	each	1.00	5.76	5.76
* Traffic Cones (@ 5 meters apart)	each	23.00	1.85	42.53
Safety Vest	each	2.00	2.22	4.44
Safety Helmet	each	2.00	0.25	0.49
Safety Shoes	each	2.00	2.77	5.55
* *Quantity is based on the assumed 50-meter length roadwork zone If the length is increased/decreased, corresponding adjustment of quantities shall be made.*				
Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.				
SUB - TOTAL (A)				**135.23**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
Traffic Controller (Flagman)	2.00	8.00	70.74	1,131.84
Unskilled Worker	2.00	2.00	70.74	282.96
SUB - TOTAL (B)				**1,414.80**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
Stake Truck (5 T)	1.00	2.00	712.00	1,424.00
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	6.00	8.00	0.65	31.27
SUB - TOTAL (C)				**1,455.27**

D. TOTAL DIRECT COST (A + B + C)			3,005.30
E. DIRECT UNIT COST (D/Quantity)			3,005.30
F. ADD: INDIRECT COST			
1. OCM (9% of D)			
2. Contractor's Profit (8% of D)		240.42	
3. VAT 12%		389.49	
** TOTAL INDIRECT COST			629.91
	TOTAL COST (D + F)		3,635.21
	TOTAL RENTAL COST		3,635.21

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 5 - Closure of Outer Lane - Multilane Road, Low Speed, Short Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Roadwork Ahead (T1-1)	each	1.00	10.95	10.95
Workmen Ahead (T1-5)	each	1.00	5.64	5.64
Lane Status (T2-6-1)	each	1.00	8.86	8.86
Temporary Hazard Marker (Chevron, T5-4)	each	3.00	8.01	24.03
* Traffic Cones (@ 5 meters apart)	each	33.00	1.85	61.03

* *Quantity is based on the assumed 50-meter length roadwork zone If the length is increased/decreased, corresponding adjustment of quantities shall be made.*

Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.

SUB - TOTAL (A) **110.51**

B. LABOR COST	QUANTITY		Unit Rate	Total Cost
	No. of Personnel	Total Hours		
Unskilled Worker	2.00	2.00	70.74	282.96

SUB - TOTAL (B) **282.96**

C. EQUIPMENT COST	QUANTITY		Hourly Rate	Total Cost
	No. of Equipt.	Total Hours		
Stake Truck (5 T)	1.00	2.00	712.00	1,424.00
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	8.00	8.00	0.65	41.69

SUB - TOTAL (C) **1,465.69**

D.	TOTAL DIRECT COST (A + B + C)		1,859.16
E.	DIRECT UNIT COST (D/Quantity)		1,859.16
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	148.73	
	3. VAT 12%	240.95	
**	TOTAL INDIRECT COST		389.68
	TOTAL COST (D + F)		2,248.84
	TOTAL RENTAL COST		2,248.84

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 6 - Closure of Center Lane - Multilane Road, Low Speed, Short Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Roadwork Ahead (T1-1)	each	2.00	10.95	21.90
Workmen Ahead (T1-5)	each	2.00	5.64	11.28
Lane Status (T2-6-1)	each	2.00	8.86	17.72
Temporary Hazard Marker (Chevron, T5-5)	each	2.00	5.76	11.52
Temporary Hazard Marker (Chevron, T5-4)	each	6.00	8.01	48.05
* Traffic Cones (@ 5 meters apart)	each	70.00	1.85	129.45

* *Quantity is based on the assumed 50-meter length roadwork zone If the length is increased/decreased, corresponding adjustment of quantities shall be made.*

Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.

SUB - TOTAL (A)	**239.93**

B. LABOR COST	QUANTITY		Unit Rate	Total Cost
	No. of Personnel	Total Hours		
Unskilled Worker	2.00	2.00	70.74	282.96
SUB - TOTAL (B)				**282.96**

C. EQUIPMENT COST	QUANTITY		Hourly Rate	Total Cost
	No. of Equipt.	Total Hours		
Stake Truck (5 T)	1.00	2.00	712.00	1,424.00
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	18.00	8.00	0.65	93.80
SUB - TOTAL (C)				**1,517.80**

D.	TOTAL DIRECT COST (A + B + C)		2,040.70
E.	DIRECT UNIT COST (D/Quantity)		2,040.70
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	163.26	
	3. VAT 12%	264.47	
**	TOTAL INDIRECT COST		427.73
	TOTAL COST (D + F)		2,468.43
	TOTAL RENTAL COST		2,468.43

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 7 (Case 1) - Part Lane Closure - 2 Lane, 2 Way Road, High Speed, Long Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Speed Restriction (R4-1)	each	4.00	4.73	18.90
Roadwork Ahead (T1-1)	each	4.00	10.95	43.81
End Roadwork (T2-16)	each	4.00	10.95	43.81
End Speed Restriction (R4-2)	each	4.00	4.73	18.90
Workmen Ahead (T1-5)	each	4.00	5.64	22.56
Prepare to Stop (T1-18)	each	2.00	5.64	11.28
Temporary Hazard Marker (Chevron, T5-5)	each	1.00	5.76	5.76
* Temporary Bollards (@ 5 meters apart)	each	16.00	1.64	26.30
* Plastic Safety Barriers	each	160.00	2.74	438.36
Safety Vest	each	2.00	2.22	4.44
Hard Hat	each	2.00	0.25	0.49
Safety Shoes	each	2.00	2.77	5.55
* *Quantity is based on the assumed 100-meter length roadwork zone If the length is increased/decreased, corresponding adjustment of quantities shall be made.*				
Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.				
SUB - TOTAL (A)				**640.16**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
Traffic Controller (Flagman)	6.00	8.00	70.74	3,395.52
Consideration: With flagmen provided for 24 hours under 3 shifts. Necessary adjustment shall be made accordingly depending on the need of the project and schedule of work)				
SUB - TOTAL (B)				**3,395.52**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
Two-way Radio (w/ lifespan consideration of 2 years)	2.00	8.00	2.60	41.67
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	29.00	8.00	0.65	151.13
SUB - TOTAL (C)				**192.80**

D.	TOTAL DIRECT COST (A + B + C)		4,228.48
E.	DIRECT UNIT COST (D/Quantity)		4,228.48
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	338.28	
	3. VAT 12%	548.01	
**	TOTAL INDIRECT COST		886.29
	TOTAL COST (D + F)		5,114.76
	TOTAL RENTAL COST		5,114.76

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 7 (Case 2) - Part Lane Closure - 2 Lane, 2 Way Road, Low Speed, Long Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Speed Restriction (R4-1)	each	4.00	4.73	18.90
Roadwork Ahead (T1-1)	each	4.00	10.95	43.81
End Roadwork (T2-16)	each	4.00	10.95	43.81
End Speed Restriction (R4-2)	each	4.00	4.73	18.90
Workmen Ahead (T1-5)	each	4.00	5.64	22.56
Prepare to Stop (T1-18)	each	2.00	5.64	11.28
Temporary Hazard Marker (Chevron, T5-5)	each	1.00	5.76	5.76
* Concrete Safety Barriers	each	47.00	2.50	117.46
* Construction Safety Fence	each	48.00	3.94	189.26
* Temporary Bollards (@ 5 meters apart)	each	16.00	1.64	26.30
Safety Vest	man-day	2.00	2.22	4.44
Hard Hat	man-day	2.00	0.25	0.49
Safety Shoes	man-day	2.00	2.77	5.55
* *Quantity is based on the assumed 27-meter length roadwork zone If the length is increased/decreased, corresponding adjustment of quantities shall be made.*				
Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.				
SUB - TOTAL (A)				**508.53**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
Traffic Controller (Flagman) *Consideration: With flagmen provided for 24 hours under 3 shifts. Necessary adjustment shall be made accordingly depending on the need of the project and schedule of work)*	6.00	8.00	70.74	3,395.52
SUB - TOTAL (B)				**3,395.52**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
Two-way Radio	2.00	8.00	2.60	41.67
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	11.00	8.00	0.65	57.33
SUB - TOTAL (C)				**98.99**

D.	TOTAL DIRECT COST (A + B + C)		4,003.04
E.	DIRECT UNIT COST (D/Quantity)		4,003.04
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	320.24	
	3. VAT 12%	518.79	
**	TOTAL INDIRECT COST		839.04
	TOTAL COST (D + F)		4,842.07
	TOTAL RENTAL COST		4,842.07

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 8 - Road Condition Signing, High Speed, Long Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Roadwork Ahead (T1-1)	each	4.00	10.95	43.81
Slippery (T3-3)	each	4.00	5.64	22.56
Loose Stones (T3-9)	each	4.00	5.64	22.56
SUB - TOTAL (A)				**88.92**

B. LABOR COST	QUANTITY		Unit Rate	Total Cost
	No. of Personnel	Total Hours		
SUB - TOTAL (B)				**-**

C. EQUIPMENT COST	QUANTITY		Hourly Rate	Total Cost
	No. of Equipt.	Total Hours		
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		88.92
E.	DIRECT UNIT COST (D/Quantity)		88.92
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	7.11	
	3. VAT 12%	11.52	
**	TOTAL INDIRECT COST		18.64
	TOTAL COST (D + F)		107.56
	TOTAL RENTAL COST		107.56

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 9 - Closure of Inner Lane - Multilane Road, High Speed, Long Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Roadwork 1 km Ahead (T1-1)	each	2.00	10.95	21.90
Lane Status (T2-6-2)	each	4.00	12.95	51.80
Road Work (R4-3)	each	2.00	3.87	7.74
Speed Restriction (R4-1)	each	2.00	4.73	9.45
Workmen Ahead (T1-5)	each	2.00	5.64	11.28
Temporary Hazard Marker (Chevron, T5-4)	each	4.00	8.01	32.03
End Speed Restriction (R4-2)	each	2.00	4.73	9.45
End Roadwork (T2-16)	each	2.00	10.95	21.90
* Plastic Safety Barriers	each	124.00	0.68	84.93
* Temporary Bollards (@ 5 meters apart)	each	27.00	1.64	44.38

* *Quantity is based on the assumed 100-meter length roadwork zone If the length is increased/decreased, corresponding adjustment of quantities shall be made.*

Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.

SUB - TOTAL (A)				**294.88**

B. LABOR COST	QUANTITY		Unit Rate	Total Cost
	No. of Personnel	Total Hours		
SUB - TOTAL (B)				**-**

C. EQUIPMENT COST	QUANTITY		Hourly Rate	Total Cost
	No. of Equipt.	Total Hours		
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	32.00	8.00	0.65	166.76
SUB - TOTAL (C)				**166.76**

D.	TOTAL DIRECT COST (A + B + C)		461.64
E.	DIRECT UNIT COST (D/Quantity)		461.64
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	36.93	
	3. VAT 12%	59.83	
**	TOTAL INDIRECT COST		96.76
	TOTAL COST (D + F)		558.40
	TOTAL RENTAL COST		558.40

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 10 - Closure of Center Lane - Multilane Road, High Speed, Long Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Roadwork 1 km Ahead (T1-1)	each	2.00	10.95	21.90
Lane Status (T2-6-2)	each	4.00	12.95	51.80
Road Work (R4-3)	each	2.00	3.87	7.74
Speed Restriction (R4-1)	each	2.00	4.73	9.45
Workmen Ahead (T1-5)	each	2.00	5.64	11.28
Temporary Hazard Marker (Chevron, T5-4)	each	6.00	8.01	48.05
Temporary Hazard Marker (Chevron, T5-5)	each	1.00	5.76	5.76
End Speed Restriction (R4-2)	each	2.00	4.73	9.45
End Roadwork (T2-16)	each	2.00	10.95	21.90
* Plastic Safety Barriers	each	210.00	2.74	575.34
* Temporary Bollards (@ 5 meters apart)	each	55.00	1.64	90.41

* *Quantity is based on the assumed 100-meter length roadwork If the programmed length is increased/decreased, corresponding adjustment of quantities shall be made.*

Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.

SUB - TOTAL (A) **853.09**

B. LABOR COST	QUANTITY		Unit Rate	Total Cost
	No. of Personnel	Total Hours		

SUB - TOTAL (B) **-**

C. EQUIPMENT COST	QUANTITY		Hourly Rate	Total Cost
	No. of Equipt.	Total Hours		
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	64.00	8.00	0.65	333.53

SUB - TOTAL (C) **333.53**

D.	TOTAL DIRECT COST (A + B + C)		1,186.62
E.	DIRECT UNIT COST (D/Quantity)		1,186.62
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	94.93	
	3. VAT 12%	153.79	
**	TOTAL INDIRECT COST		248.72
	TOTAL COST (D + F)		1,435.34
	TOTAL RENTAL COST		1,435.34

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 11 -Detour via the Existing Road Network - Low or High Speed, Short or Long Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Roadwork Ahead (T1-1)	each	2.00	10.95	21.90
Detour Ahead (T5-1)	each	4.00	6.54	26.17
Detour (Left or Right) (T5-1)	each	12.00	4.80	57.55
Detour Marker (T5-6)	each	6.00	3.26	19.53
Local Traffic Only (G9-40-2)	each	1.00	5.64	5.64
Road Closed (T2-4)	each	2.00	5.55	11.10
End Detour (T2-23)	each	2.00	6.54	13.09
SUB - TOTAL (A)				**154.98**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
SUB - TOTAL (B)				**-**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	4.00	8.00	0.65	20.85
SUB - TOTAL (C)				**20.85**

D.	TOTAL DIRECT COST (A + B + C)		175.82
E.	DIRECT UNIT COST (D/Quantity)		175.82
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	14.07	
	3. VAT 12%	22.79	
**	TOTAL INDIRECT COST		36.85
	TOTAL COST (D + F)		212.68
	TOTAL RENTAL COST		212.68

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 12 -Detour via A Side Track - Low Speed, Long Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Roadwork Ahead (T1-1)	each	4.00	10.95	43.81
End Roadwork (T2-16)	each	2.00	10.95	21.90
Detour Ahead (T5-1)	each	4.00	6.54	26.17
Detour Marker (T5-6)	each	4.00	3.26	13.02
End Detour (T2-23)	each	2.00	6.54	13.09
Temporary Hazard Marker (Chevron, T5-4)	each	13.00	8.01	104.11
* Temporary Bollards	each	60.00	1.64	98.63

* *Quantity is variable depending on the roadwork length If the programmed length is increased/decreased, corresponding adjustment of quantities shall be made.*

	SUB - TOTAL (A)			**320.74**

B. LABOR COST	QUANTITY		Unit Rate	Total Cost
	No. of Personnel	Total Hours		
SUB - TOTAL (B)				**-**

C. EQUIPMENT COST	QUANTITY		Hourly Rate	Total Cost
	No. of Equipt.	Total Hours		
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	20.00	8.00	0.65	104.23
SUB - TOTAL (C)				**104.23**

D.	TOTAL DIRECT COST (A + B + C)		424.96
E.	DIRECT UNIT COST (D/Quantity)		424.96
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)		
	2. Contractor's Profit (8% of D)	34.00	
	3. VAT 12%	55.08	
	TOTAL INDIRECT COST		89.07
	TOTAL COST (D + F)		514.04
	TOTAL RENTAL COST		514.04

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 13 - Detour via A Side Track - High Speed, Long Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Speed Restriction (R4-1)	each	4.00	4.73	18.90
Roadwork Ahead (T1-1)	each	4.00	10.95	43.81
End Roadwork (T2-16)	each	2.00	10.95	21.90
Detour Ahead (T5-1)	each	4.00	6.54	26.17
End Detour (T2-23)	each	2.00	6.54	13.09
Temporary Hazard Marker (Chevron, T5-4)	each	13.00	8.01	104.11
End Speed Restriction (R4-2)	each	4.00	4.73	18.90
* Temporary Bollards	each	60.00	1.64	98.63

* *Quantity is variable depending on the roadwork length If the programmed length is increased/decreased, corresponding adjustment of quantities shall be made.*

SUB - TOTAL (A)		**345.52**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
SUB - TOTAL (B)				**-**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color, w/ lifespan consideration of 6 months)	20.00	8.00	0.65	104.23
SUB - TOTAL (C)				**104.23**

D.	TOTAL DIRECT COST (A + B + C)		449.75
E.	DIRECT UNIT COST (D/Quantity)		449.75
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	35.98	
	3. VAT 12%	58.29	
**	TOTAL INDIRECT COST		94.27
	TOTAL COST (D + F)		544.02
	TOTAL RENTAL COST		544.02

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 14 - Works at an Intersection - Low Speed, Short or Long Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Roadwork Ahead (T1-1)	each	4.00	10.95	43.81
End Roadwork (T2-16)	each	4.00	10.95	43.81
Workmen Ahead (T1-5)	each	4.00	5.64	22.56
Temporary Hazard Marker (Chevron, T5-5)	each	6.00	5.76	34.57
* Traffic Cones	each	80.00	1.85	147.95
SUB - TOTAL (A)				**292.68**

* *Quantity is based on the assumed 50-meter length roadwork If the programmed length is increased/decreased, corresponding adjustment of quantities shall be made.*

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
SUB - TOTAL (B)				**-**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		292.68
E.	DIRECT UNIT COST (D/Quantity)		292.68
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	26.34	
	2. Contractor's Profit (8% of D)	23.41	
	3. VAT 12%	41.09	
**	TOTAL INDIRECT COST		90.85
	TOTAL COST (D + F)		383.53
	TOTAL RENTAL COST		383.53

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 15 - Works at an Intersection - High Speed, Short or Long Term)

ITEM NO/DESCRIPTION : **B.8 - Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : day
QUANTITY : 1.00

A)	MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
	Speed Restriction (R4-1)	each	4.00	4.73	18.90
	Roadwork Ahead (T1-1)	each	8.00	10.95	87.61
	End Roadwork (T2-16)	each	4.00	10.95	43.81
	Workmen Ahead (T1-5)	each	8.00	5.64	45.11
	Temporary Hazard Marker (Chevron, T5-5)	each	6.00	5.76	34.57
	End Speed Restriction (R4-2)	each	4.00	4.73	18.90
*	Traffic Cones	each	80.00	1.85	147.95

* *Quantity is based on the assumed 50-meter length roadwork If the programmed length is increased/decreased, corresponding adjustment of quantities shall be made.*

	SUB - TOTAL (A)	**396.86**

B.	LABOR COST	QUANTITY		Unit Rate	Total Cost
		No. of Personnel	Total Hours		
	SUB - TOTAL (B)				**-**

C.	EQUIPMENT COST	QUANTITY		Hourly Rate	Total Cost
		No. of Equipt.	Total Hours		
	SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		396.86
E.	DIRECT UNIT COST (D/Quantity)		396.86
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	31.75	
	3. VAT 12%	51.43	
**	TOTAL INDIRECT COST		83.18
	TOTAL COST (D + F)		480.04
	TOTAL RENTAL COST		480.04

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 16 - Lane Marking of Centerline - 2 Lane, 2 Way Road)

ITEM NO/DESCRIPTION : **Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : sq.m
OUTPUT PER HOUR : 25
QUANTITY : 22.50 sq.m. (for 300 meter set-up)

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
SUB - TOTAL (A)				-

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
SUB - TOTAL (B)				-

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
Illuminated Flashing Arrow Boards (Battery or Genset Operated)	6.00	0.900		-
SUB - TOTAL (C)				-

D.	TOTAL DIRECT COST (A + B + C)		-
E.	DIRECT UNIT COST (D/Quantity)		-
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	-	
	3. VAT 12%	-	
**	TOTAL INDIRECT COST		-
	TOTAL COST (D + F)		-
	TOTAL RENTAL COST		-
			-

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 17- Lane Marking of Centerline - Multilane Road)

ITEM NO/DESCRIPTION : **Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : sq.m
OUTPUT PER HOUR : 25
QUANTITY : 22.50 sq.m. (for 300 meter set-up)

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
SUB - TOTAL (A)				-
Total Rental Cost of Required Signage per Day =				-

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
SUB - TOTAL (B)				-

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
Illuminated Flashing Arrow Boards (Battery or Genset Operated)	3.00	0.90		
SUB - TOTAL (C)				-

D. TOTAL DIRECT COST (A + B + C)			-
E. DIRECT UNIT COST (D/Quantity)			-
F. ADD: INDIRECT COST			
1. OCM (9% of D)	-		
2. Contractor's Profit (8% of D)	-		
3. VAT 12%	-		
** TOTAL INDIRECT COST			-
TOTAL COST (D + F)			-
TOTAL RENTAL COST			-

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Detailed Unit Price Analysis

(Layout 18 - Lane Marking of Edgeline)

ITEM NO/DESCRIPTION : **Road Works Safety and Traffic Management**
UNIT OF MEASUREMENT : sq.m
OUTPUT PER HOUR : 25
QUANTITY : 30.00 sq.m. (for 300 meter set-up)

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
SUB - TOTAL (A)				-

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
SUB - TOTAL (B)				-

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
Illuminated Flashing Arrow Boards (Battery or Genset Operated)	3.00	1.20		
SUB - TOTAL (C)				-

D.	TOTAL DIRECT COST (A + B + C)		-
E.	DIRECT UNIT COST (D/Quantity)		-
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	-	
	3. VAT 12%	-	
	TOTAL INDIRECT COST		-
	TOTAL COST (D + F)		-
	TOTAL RENTAL COST		-

** *Mark-up percentage varies depending on the Total Direct Cost of the project. Applied herein is based on D.O. 22, Series of 2015.*

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances. Night differential may also be considered in the estimate of labor cost for the traffic controller to give consideration for anticipated nighttime operation. Further, unit of measure as used herein is “day” for ease of deriving the total cost (i.e. daily rental to monthly rental or lump sum).

Relative Percentage of Cost for Road Works Safety and Traffic Management to the Cost of Civil Works

B – 4.3

Table 4. RELATIVE COST OF ROADWORKS SAFETY & TRAFFIC MANAGEMENT TO THE COST OF CIVIL WORKS

Note: Project Cost/ Reference Amount and duration reflected herein is based on D.O. 44 Series of 2012

A. ROADS

1 Paved (Concrete) to Paved (Concrete)

Pavement Width = 6.70 m | *Shoulder Width = 2.00 m* | *Pavement Thickness = 0.23 m*

Length	1.00 km.	0.46 km.	1.86 km.	4.65 km.	9.30 km.	13.95 km.
Reference Amount / Cost of Civil Works	10,753,876.80	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)	55.00	26	102	254	507	760
Applicable Traffic Management Layout	Layout No. 7	Layout No. 7	Layout No. 7	Layout No. 7	Layout No. 7	Layout No. 7
Number of Set-up	2	1	2	2	2	2
Rental Cost per Set-up per Day	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76
Total Estimated Cost of Road Works Safety & Traffic Management	562,623.30	132,983.69	1,043,410.48	2,598,296.68	5,186,363.85	7,774,431.01
Relative Weight (%)	5.23	2.66	5.22	5.20	5.19	5.18
Say	5.25	2.70	5.25	5.20	5.20	5.20
					Maximum =	**5.25**

2 Paved (Asphalt) to Paved (Concrete)

Length	1.00 km.	0.41 km.	1.63 km.	4.09 km.	8.17 km.	12.26 km.
Reference Amount / Cost of Civil Works	12,234,914.12	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)	52.00	21	85	213	423	638
Applicable Traffic Management Layout	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7
Number of Set-up	2	1	2	2	2	2
Rental Cost per Set-up per Day	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76
Total Estimated Cost of Road Works Safety & Traffic Management	531,934.75	107,409.90	869,508.73	2,178,886.59	4,327,084.63	6,526,430.24
Relative Weight (%)	4.35	2.15	4.35	4.36	4.33	4.35
Say	4.35	2.15	4.35	4.40	4.35	4.40
					Maximum =	**4.40**

3 Paved (Asphalt) to Paved (Asphalt)

Pavement Width = 6.70 m | *Shoulder Width = 2.00 m* | *Pavement Thickness = 100 mm*

Length	1.00 km.	0.35 km.	1.40 km.	3.51 km.	7.01 km.	10.52 km.
Reference Amount / Cost of Civil Works	14,259,959.77	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)	40.00	14	56	140	281	421
Applicable Traffic Management Layout	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7
Number of Set-up	2	1	2	2	2	2
Rental Cost per Set-up per Day	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76
Total Estimated Cost of Road Works Safety & Traffic Management	409,180.58	71,606.60	572,852.81	1,432,132.03	2,874,493.57	4,306,625.60
Relative Weight (%)	2.87	1.43	2.86	2.86	2.87	2.87
Say	2.90	1.45	2.90	2.90	2.90	2.90
					Maximum =	**2.90**

A. ROADS

4 Gravel to Asphalt | *Pavement Width = 6.70 m* | *Shoulder Width = 2.00 m* | *Pavement Thickness = 100 mm*

Length	1.00 km.	0.32 km.	1.26 km.	3.16 km.	6.32 km.	9.49 km.
Reference Amount / Cost of Civil Works	15,811,255.67	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)	31.00	10	40	99	197	295
Applicable Traffic Management Layout	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7
Number of Set-up	2	1	2	2	2	2
Rental Cost per Set-up per Day	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76
Total Estimated Cost of Road Works Safety & Traffic Management	317,114.95	51,147.57	409,180.58	1,012,721.93	2,015,214.35	3,017,706.77
Relative Weight (%)	2.01	1.02	2.05	2.03	2.02	2.01
Say	2.05	1.05	2.05	2.05	2.05	2.05
					Maximum =	**2.05**

5 Gravel to Concrete

Length	1.00 km.	0.42 km.	1.68 km.	4.20 km.	8.40 km.	12.60 km.
Reference Amount / Cost of Civil Works	11,901,170.48	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)	39.00	17	65	162	324	486
Applicable Traffic Management Layout	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7
Number of Set-up	2	1	2	2	2	2
Rental Cost per Set-up per Day	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76
Total Estimated Cost of Road Works Safety & Traffic Management	398,951.07	86,950.87	664,918.44	1,657,181.35	3,314,362.69	4,971,544.04
Relative Weight (%)	3.35	1.74	3.32	3.31	3.31	3.31
Say	3.40	1.75	3.35	3.35	3.35	3.35
					Maximum =	**3.40**

6 Asphalt Overlay | *Pavement Width = 6.70 m* | *Shoulder Width = 2.00 m* | *Pavement Thickness = 50 mm*

Length	1.00 km.	0.72 km.	2.89 km.	7.23 km.	14.46 km.	21.69 km.
Reference Amount / Cost of Civil Works	6,915,785.73	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)	14.00	11	41	102	203	304
Applicable Traffic Management Layout	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7
Number of Set-up	1	1	1	1	1	1
Rental Cost per Set-up per Day	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76
Total Estimated Cost of Road Works Safety & Traffic Management	71,606.60	56,262.33	209,705.05	521,705.24	1,038,295.72	1,554,886.20
Relative Weight (%)	1.04	1.13	1.05	1.04	1.04	1.04
Say	1.05	1.15	1.05	1.10	1.05	1.05
					Maximum =	**1.15**

A. ROADS

7 Concrete Reblocking, 30% of existing PCCP

Length	1.00 km.	0.54 km.	2.17 km.	5.42 km.	10.85 km.	16.27 km.
Reference Amount / Cost of Civil Works	9,218,747.25	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)	26.00	14	56	139	277	415
Applicable Traffic Management Layout	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7
Number of Set-up	1	1	1	1	1	1
Rental Cost per Set-up per Day	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76
Total Estimated Cost of Road Works Safety & Traffic Management	132,983.69	71,606.60	286,426.41	710,951.26	1,416,787.76	2,122,624.26
Relative Weight (%)	1.44	1.43	1.43	1.42	1.42	1.42
Say	1.45	1.45	1.45	1.45	1.45	1.45
					Maximum =	**1.45**

8 Concrete Reblocking, 50% of existing PCCP

Length	1.00 km.	0.44 km.	1.76 km.	4.40 km.	8.79 km.	13.19 km.
Reference Amount / Cost of Civil Works	11,375,139.57	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)	36.00	16	64	159	317	475
Applicable Traffic Management Layout	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7	Layout 7
Number of Set-up	1	1	1	1	1	1
Rental Cost per Set-up per Day	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76	5,114.76
Total Estimated Cost of Road Works Safety & Traffic Management	184,131.26	81,836.12	327,344.46	813,246.40	1,621,378.05	2,429,509.69
Relative Weight (%)	1.62	1.64	1.64	1.63	1.62	1.62
Say	1.65	1.65	1.65	1.65	1.70	1.70
					Maximum =	**1.70**

9 Re-Gravelling

Length	1.00 km.	2.17 km.	8.70 km.	21.74 km.	43.48 km.	65.22 km.
Reference Amount / Cost of Civil Works	2,300,050.60	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)	10.00	22	87	218	435	653
Applicable Traffic Management Layout	Layout 8	Layout 8	Layout 8	Layout 8	Layout 8	Layout 8
Number of Set-up	1	1	1	1	1	1
Rental Cost per Set-up per Day	107.56	107.56	107.56	107.56	107.56	107.56
Total Estimated Cost of Road Works Safety & Traffic Management	1,075.58	2,366.27	9,357.52	23,447.59	46,787.62	70,235.20
Relative Weight (%)	0.05	0.05	0.05	0.05	0.05	0.05
Say	0.05	0.05	0.05	0.05	0.05	0.05
					Maximum =	**0.05**

A. ROADS

10 Widening Paved

Length	1.00 km.	0.78 km.	3.13 km.	7.84 km.	15.67 km.	23.51 km.
Reference Amount / Cost of Civil Works	6,380,050.21	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)	28.00	22	87	216	432	647
Applicable Traffic Management Layout	Layout 7 w/o Traffic Controller	Layout 7 w/o Traffic Controller	Layout 7 w/o Traffic Controller	Layout 7 w/o Traffic Controller	Layout 7 w/o Traffic Controller	Layout 7 w/o Traffic Controller
Number of Set-up	2	2	2	2	2	2
Rental Cost per Set-up per Day	994.85	994.85	994.85	994.85	994.85	994.85
Total Estimated Cost of Road Works Safety & Traffic Management	55,711.85	43,773.60	173,104.67	429,777.12	859,554.23	1,287,341.64
Relative Weight (%)	0.87	0.88	0.87	0.86	0.86	0.86
Say	0.90	0.90	0.90	0.90	0.90	0.90
					Maximum =	**0.90**

B. BRIDGE (Based on Typical Standard Design)

1 RCDG on R.C. Pile Foundation

Length		15 l.m. @ 1 Span of 15 l.m.	63 l.m. @ 3 Spans of 21 l.m.	168 l.m. @ 7 Spans of 24 l.m.	312 l.m. @ 13 Spans of 24 l.m.	456 l.m. @ 19 Spans of 24 l.m.
Reference Amount / Cost of Civil Works		5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)		125	200	335	510	685
Applicable Traffic Management Layout		Layout 13	Layout 13	Layout 13	Layout 13	Layout 13
Number of Set-up		1	1	1	1	1
Rental Cost per Set-up per Day		544.02	631.83	808.53	1,032.47	1,257.25
Total Estimated Cost of Road Works Safety & Traffic Management		68,002.01	126,365.54	270,857.03	526,561.56	861,214.35
Relative Weight (%)		1.36	0.63	0.54	0.53	0.57
Say		1.40	0.70	0.60	0.60	0.60

2 PSCG on R.C. Pile Foundation

Length		15 l.m. @ 1 Span of 15 l.m.	48 l.m. @ 2 Spans of 24 l.m.	120 l.m. @ 5 Spans of 24 l.m.	240 l.m. @ 10 Spans of 24 l.m.	360 l.m. @ 15 Spans of 24 l.m.
Reference Amount / Cost of Civil Works		5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)		140	180	225	295	375
Applicable Traffic Management Layout		Layout 13	Layout 13	Layout 13	Layout 13	Layout 13
Number of Set-up		1	1	1	1	1
Rental Cost per Set-up per Day		544.02	602.84	729.26	923.43	1,118.15
Total Estimated Cost of Road Works Safety & Traffic Management		76,162.25	108,512.03	164,084.03	272,411.68	419,307.07
Relative Weight (%)		1.52	0.54	0.33	0.27	0.28
Say		1.60	0.60	0.40	0.30	0.30

B. BRIDGE (Based on Typical Standard Design)

3 RCDG on Bored Pile Foundation

Length		15 l.m. @ 1 Span of 15 l.m.	72 l.m. @ 3 Spans of 24 l.m.	168 l.m. @ 7 Spans of 24 l.m.	312 l.m. @ 13 Spans of 24 l.m.	456 l.m. @ 19 Spans of 24 l.m.
Reference Amount / Cost of Civil Works		5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)		105	195	320	530	735
Applicable Traffic Management Layout		Layout 13	Layout 13	Layout 13	Layout 13	Layout 13
Number of Set-up		1	1	1	1	1
Rental Cost per Set-up per Day		544.02	638.84	796.16	1,016.29	1,237.53
Total Estimated Cost of Road Works Safety & Traffic Management		57,121.69	124,573.23	254,769.70	538,632.63	909,584.94
Relative Weight (%)		1.14	0.62	0.51	0.54	0.61
Say		1.25	0.75	0.75	0.75	0.75

4 PSCG on Bored Pile Foundation

Length		15 l.m. @ 1 Span of 15 l.m.	48 l.m. @ 2 Spans of 24 l.m.	120 l.m. @ 5 Spans of 24 l.m.	240 l.m. @ 10 Spans of 24 l.m.	360 l.m. @ 15 Spans of 24 l.m.
Reference Amount / Cost of Civil Works		5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
Duration (C.D.)		105	145	210	305	405
Applicable Traffic Management Layout		Layout 13	Layout 13	Layout 13	Layout 13	Layout 13
Number of Set-up		1	1	1	1	1
Rental Cost per Set-up per Day		544.02	599.63	722.78	914.38	1,107.10
Total Estimated Cost of Road Works Safety & Traffic Management		57,121.69	86,946.02	151,783.58	278,885.72	448,375.38
Relative Weight (%)		1.14	0.43	0.30	0.28	0.30
Say		1.25	0.50	0.50	0.50	0.50

Table 5. Relative weight of the cost of road works safety and traffic management to the civil works

Project Category / Level of Improvement			Percentage of Cost for Road Works Safety & Traffic Management Relative to the Cost of Civil Works
A. Roads			
	1	Paved (Concrete) To Paved (Concrete)	5.25
	2	Paved (Asphalt) To Paved (Concrete)	4.40
	3	Paved (Asphalt) To Paved (Asphalt)	2.90
	4	Gravel To Asphalt	2.05
	5	Gravel To Concrete	3.40
	6	Asphalt Overlay	1.15
	7	Concrete Reblocking, 30% of existing PCCP	1.45
	8	Concrete Reblocking, 50% of existing PCCP	1.70
	9	Re-Gravelling	0.05
	10	Widening Paved	0.90
B. Bridges			
	1	RCDG on RC. Pile Foundation	1.40
	2	PSCG on RC. Pile Foundation	1.60
	3	RCDG on Bored Pile Foundation	1.25
	4	PSCG on Bored Pile Foundation	1.25

Note: Derived percentage of cost of road works safety & traffic management requirements (as per TMP) relative to civil works is advisably lower than the values above or within +10%.

Sample Computation and Illustrations

B – 4.4

SAMPLE ILLUSTRATION NO. 1
Road Reconstruction
1 Km length road, two lanes

- ***Site Condition:***

A proposed 1 kilometer continuous road reconstruction work has the following road construction and traffic conditions to be considered:

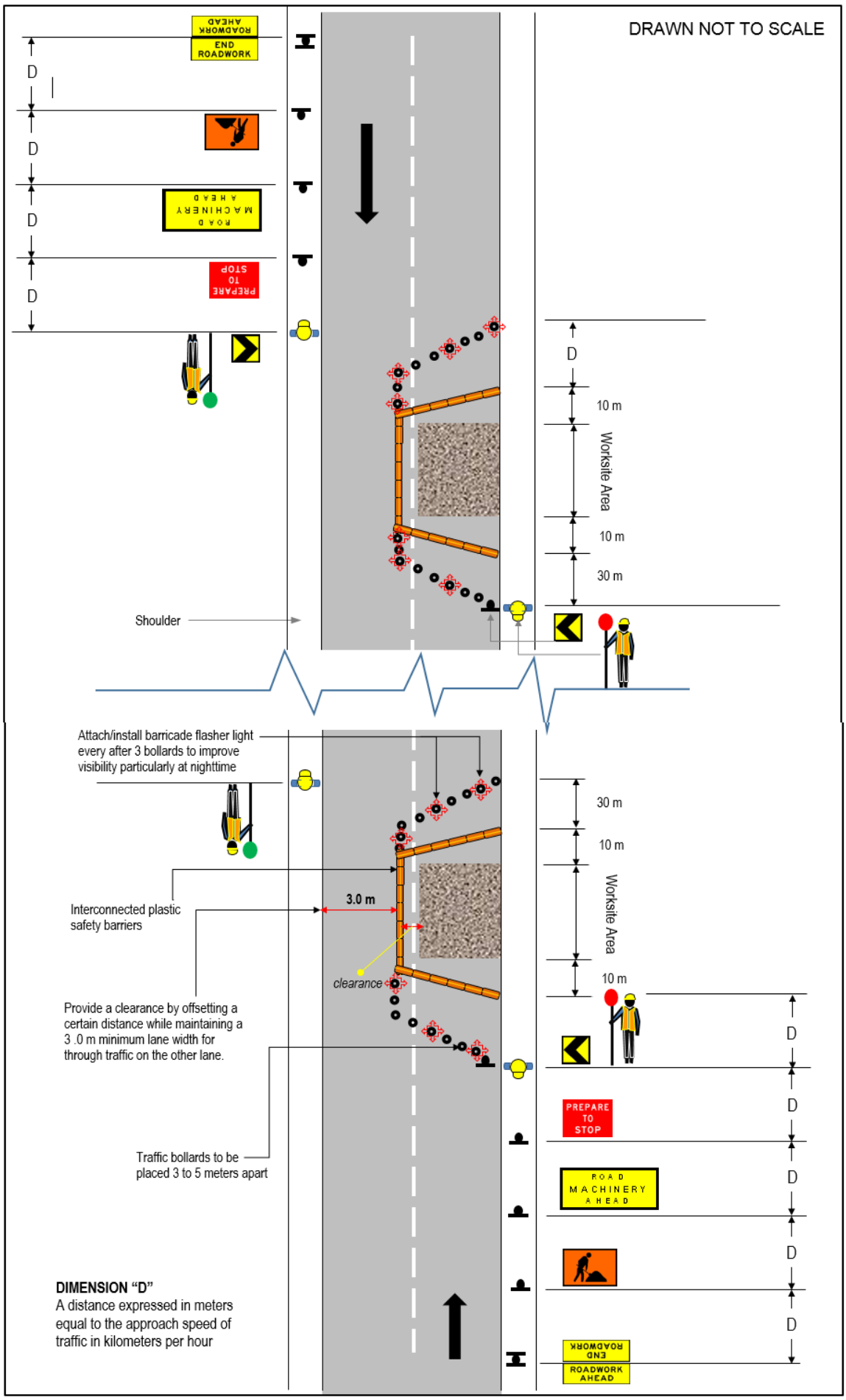
Road Location	Rural Area
Direction of traffic	Two way traffic
Number of Lanes	Two Lanes
Maximum Speed of Vehicles	40 kph (Low Speed)
Designed strength of concrete for the PCCP	3-day concrete (3 days curing period)

- ***Proposed Traffic Management Layout***

In this condition, each series of roadwork set-up or layout is planned to be 100 meter in length. To facilitate the completion of work, 2 set-ups are proposed to be undertaken performing parallel works. Qualifying this as a long term work, Layout 7 (Case 1) – Part Lane Closure can be considered as the applicable traffic management layout but with some modifications to suit actual project condition and requirements.

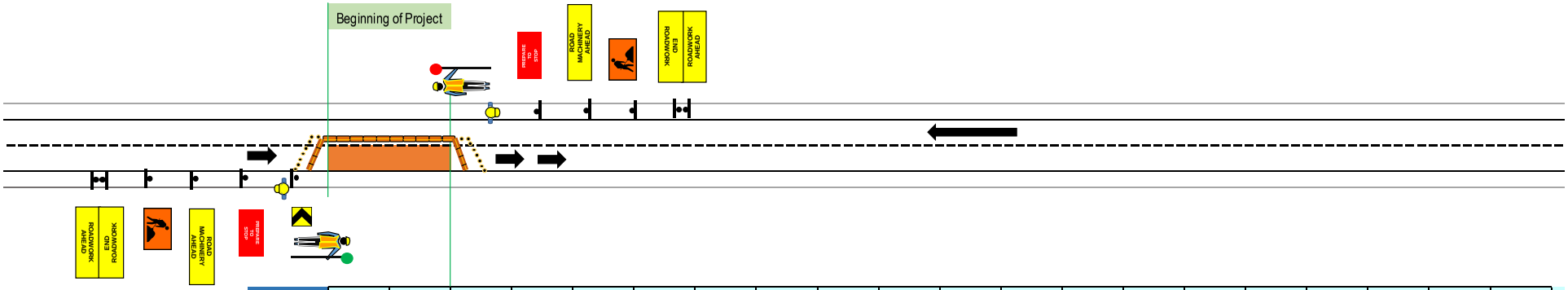
Illustrated below is the proposed traffic management scheme with two set-ups operating on opposite ends of the stretch of the road to be reconstructed. The two groups will be moving forward to meet at the center until the works in one lane are completed. Considering the distance between the two on-going operations, the traffic controllers shall be provided with hand held two-way radio for communication and coordination. As the groups meet towards the center, the number of traffic controllers may be reduced and a longer stretch of the road/area will be closed as work zone.

The corresponding DUPA reflecting the estimated cost for road works safety and traffic management based on the aforementioned proposed traffic management scheme is also presented.


DRAWN NOT TO SCALE
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
D
10 m
Worksite Area
10 m
30 m
Shoulder
SET-UP 1 (Operating at the other end)
Attach/install barricade flasher light every after 3 bollards to improve visibility particularly at nighttime
Interconnected plastic safety barriers
3.0 m
clearance
Provide a clearance by offsetting a certain distance while maintaining a 3 .0 m minimum lane width for through traffic on the other lane.
Traffic bollards to be placed 3 to 5 meters apart
DIMENSION "D"
A distance expressed in meters equal to the approach speed of traffic in kilometers per hour
SET-UP 1 (Operating at one end)

DAY 1

PROPOSED TRAFFIC MANAGEMENT SCHEME



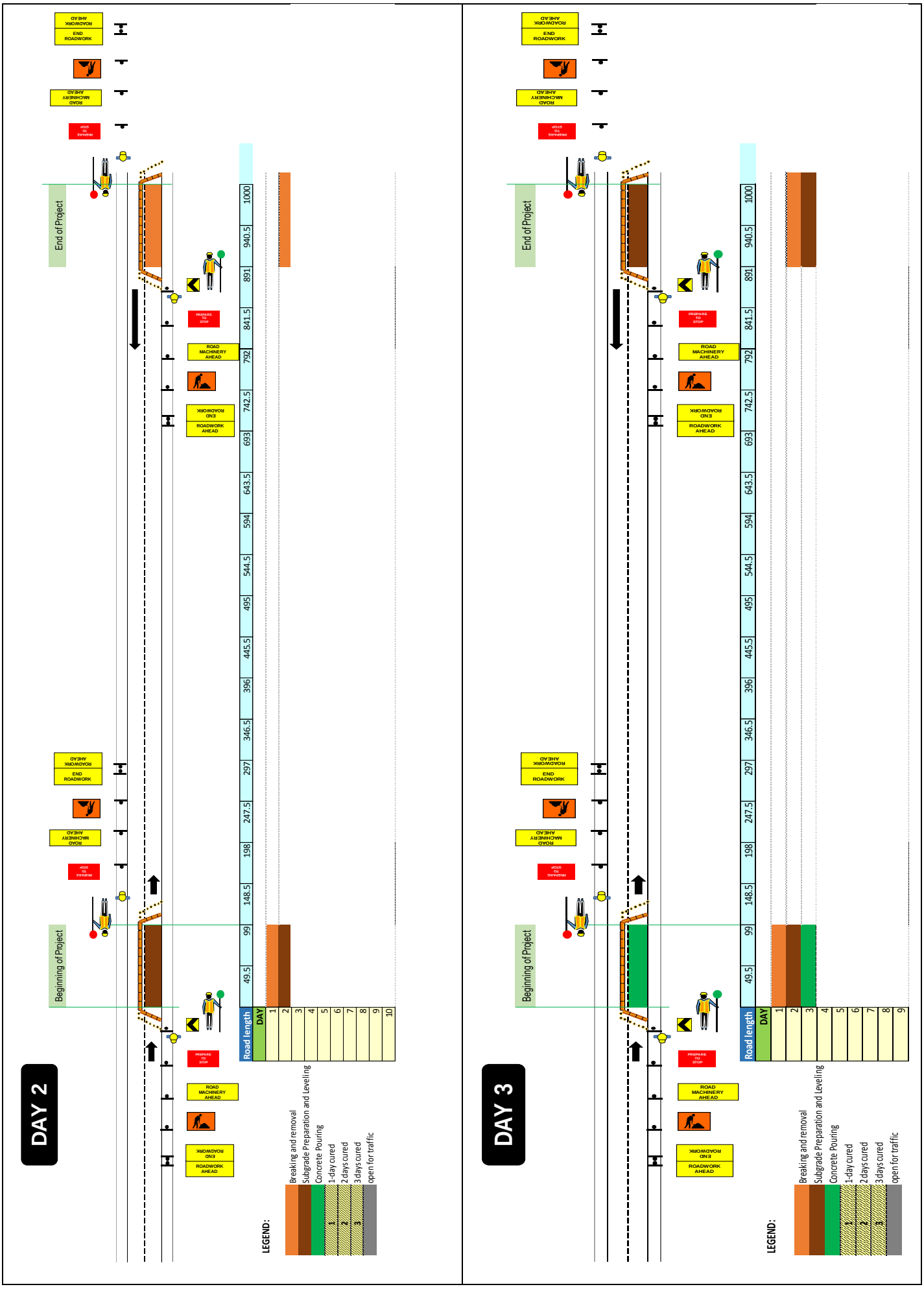
Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13																				
14																				
15																				
16																				
17																				
18																				
19																				
20																				

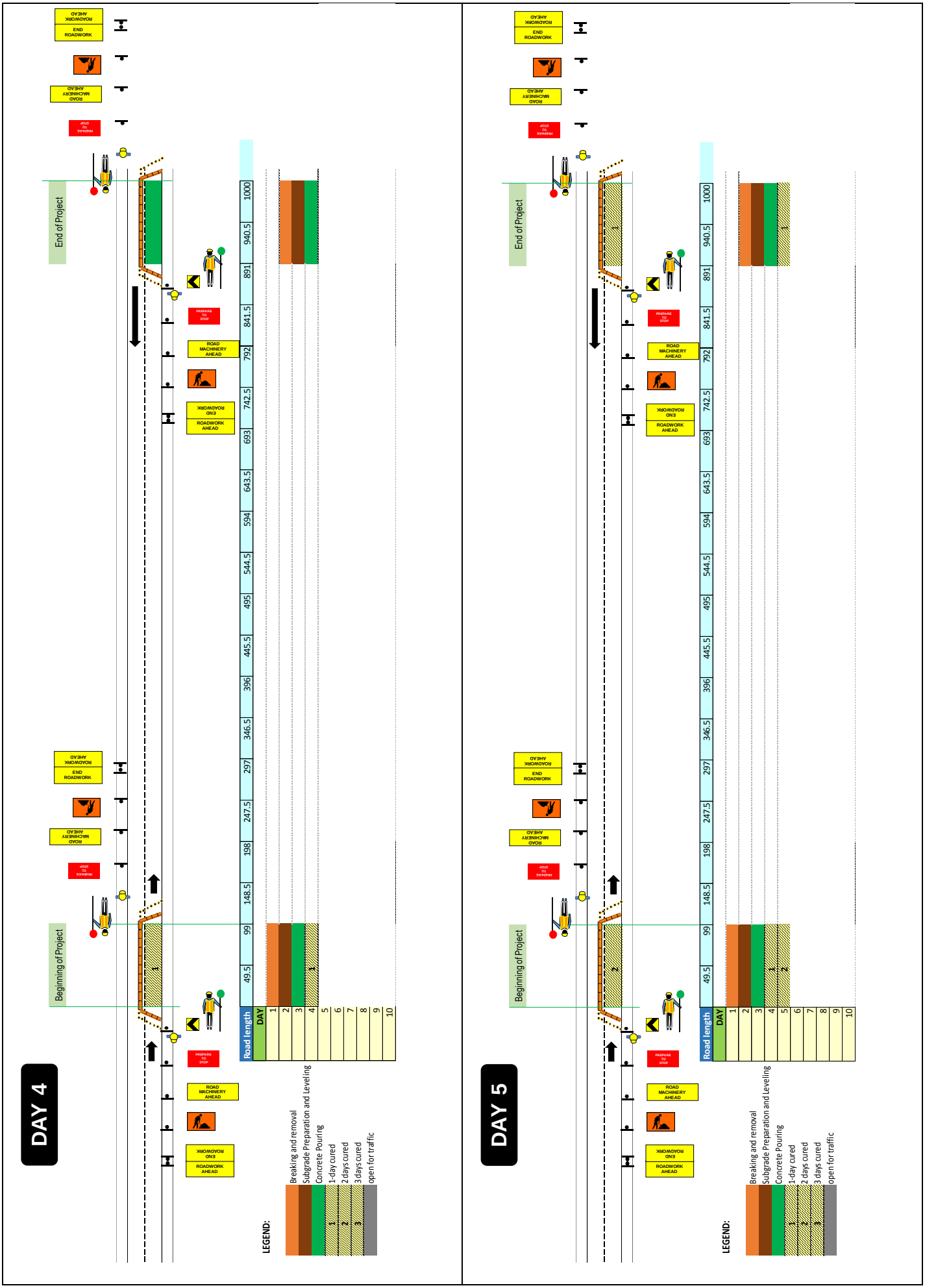
LEGEND:

- Breaking and removal
- Subgrade Preparation and Leveling
- Concrete Pouring
- 1 — 1-day cured
- 2 — 2 days cured
- 3 — 3 days cured
- open for traffic

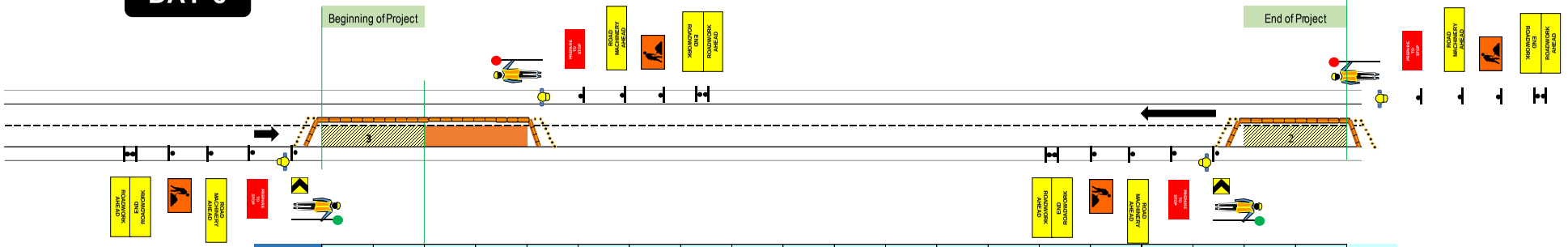
For a 100-meter length, single lane road work zone, 230 mm thk.

Output per hour:			Time (hr)
102 (2)	Removal of Structure (PCCP, t=230 mm)	40 m^2	8.375
105	Subgrade Preparation	300 m^2	1.12
200 (1)	Levelling Course (Subbase Course)	50 m^3	0.067
201	Aggregate Base Course (Shoulder)	50 m^3	n/a
311	PCCP (230 mm thk.)	70 m^2	4.79


DAY 2
End of Project
Beginning of Project
PREPARE TO STOP
ROAD MACHINERY AHEAD
ROADWORK AHEAD
END ROADWORK
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1 2 3 4 5 6 7 8 9 10
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic
DAY 3
End of Project
Beginning of Project
PREPARE TO STOP
ROAD MACHINERY AHEAD
ROADWORK AHEAD
END ROADWORK
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1 2 3 4 5 6 7 8 9
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic


DAY 4
End of Project
Beginning of Project
PREPARE TO STOP
ROAD MACHINERY AHEAD
ROADWORK END ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
4
5
6
7
8
9
10
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic
DAY 5
End of Project
Beginning of Project
PREPARE TO STOP
ROAD MACHINERY AHEAD
ROADWORK END ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
4
5
6
7
8
9
10
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic

DAY 6



Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4			1																	
5			2																	
6			3																	
7																				
8																				
9																				

LEGEND:

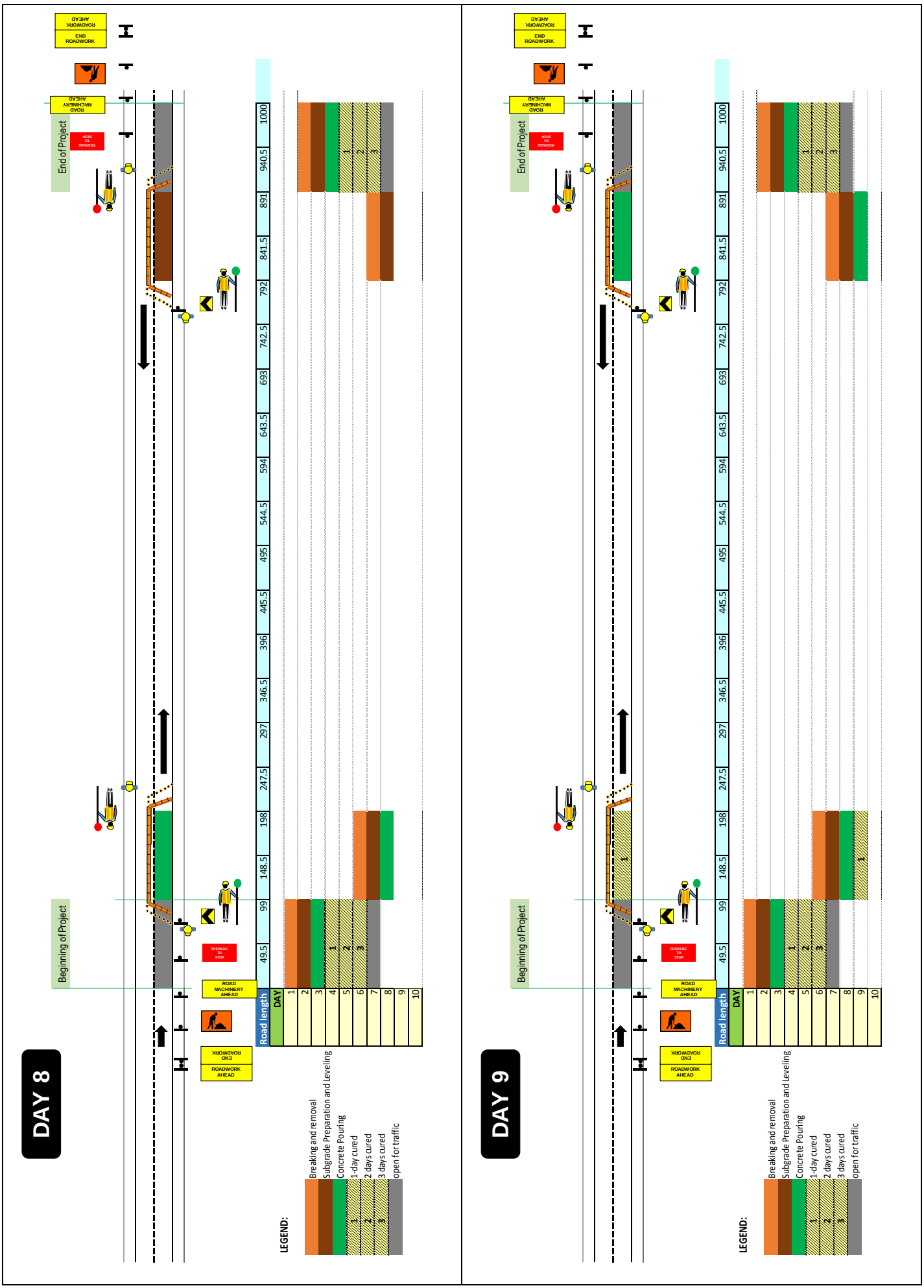
- Breaking and removal
- Subgrade Preparation and Leveling
- Concrete Pouring
- 1 — 1-day cured
- 2 — 2 days cured
- 3 — 3 days cured
- open for traffic

DAY 7

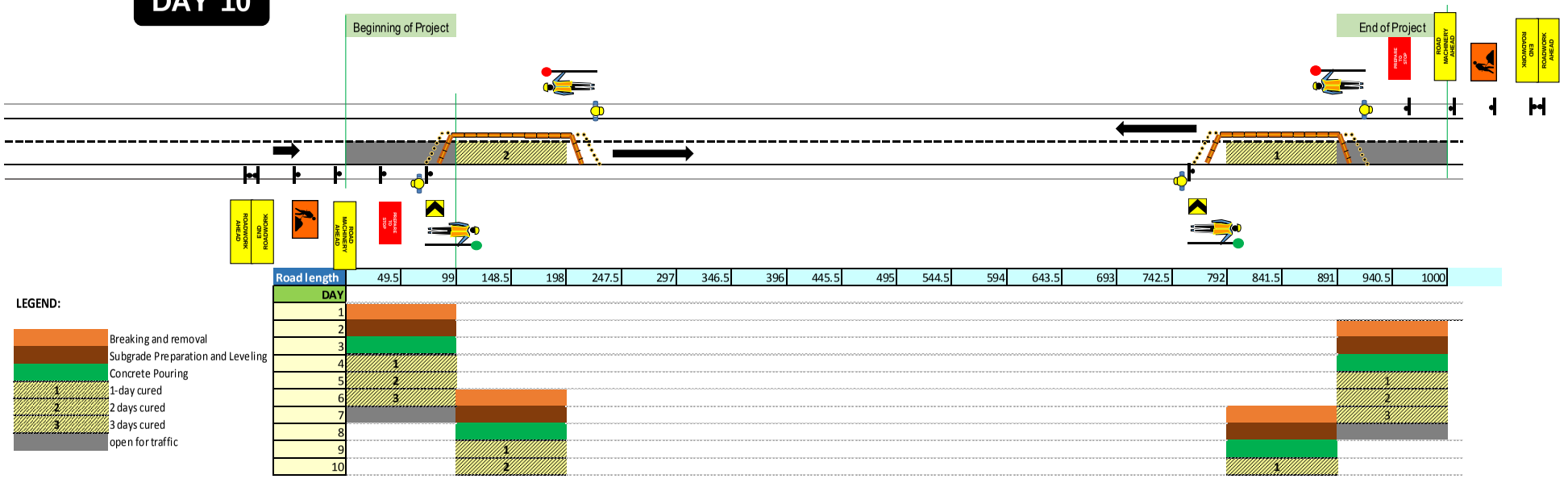
Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4					1															
5					2															
6					3															
7																				
8																				
9																				
10																				

LEGEND:

- Breaking and removal
- Subgrade Preparation and Leveling
- Concrete Pouring
- 1 — 1-day cured
- 2 — 2 days cured
- 3 — 3 days cured
- open for traffic


DAY 8
Beginning of Project
End of Project
PREPARE TO STOP
ROAD MACHINERY AHEAD
ROADWORK AHEAD
END ROADWORK
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
Road length
DAY
1
2
3
4
5
6
7
8
9
10
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic
DAY 9
Beginning of Project
End of Project
PREPARE TO STOP
ROAD MACHINERY AHEAD
ROADWORK AHEAD
END ROADWORK
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
Road length
DAY
1
2
3
4
5
6
7
8
9
10
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic

DAY 10

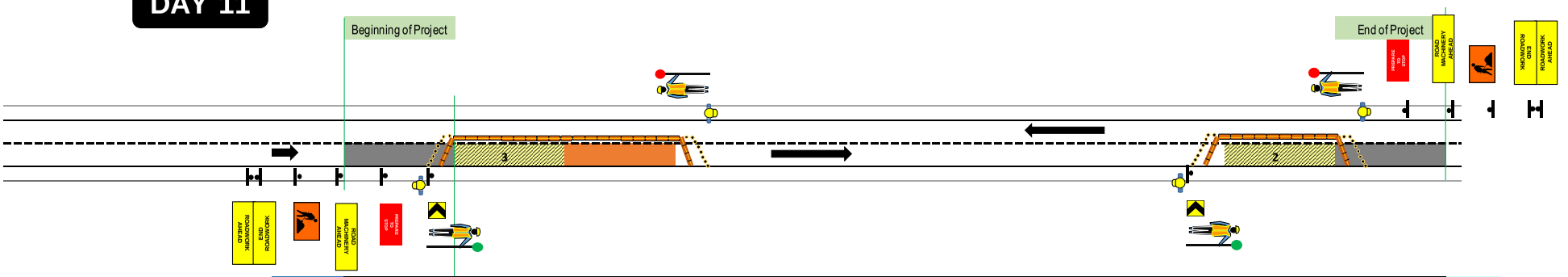


Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4	1																			
5	2																			
6	3																			
7																				
8																				
9			1																	
10			2																	

LEGEND:

- Breaking and removal
- Subgrade Preparation and Leveling
- Concrete Pouring
- 1 — 1-day cured
- 2 — 2 days cured
- 3 — 3 days cured
- open for traffic

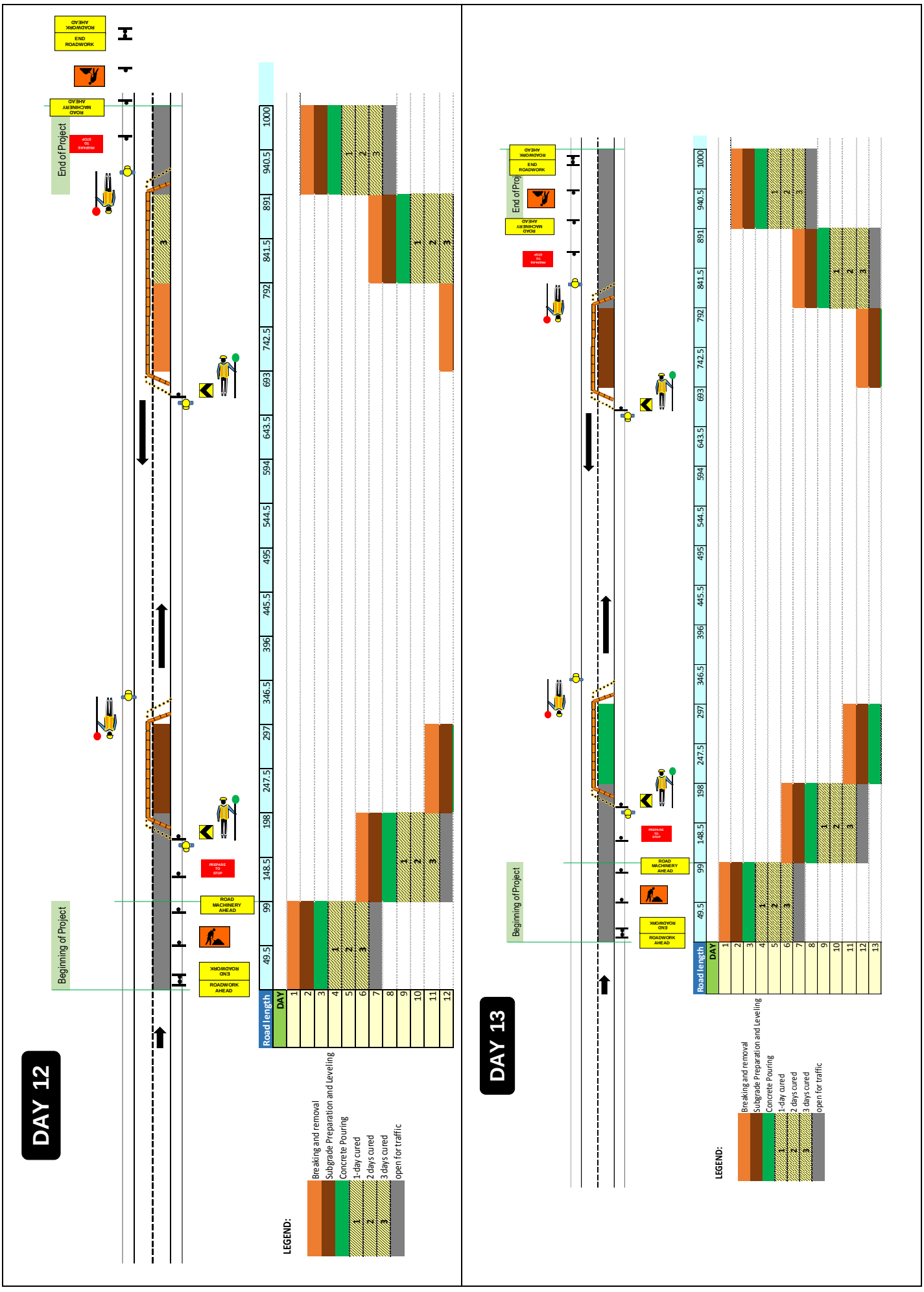
DAY 11

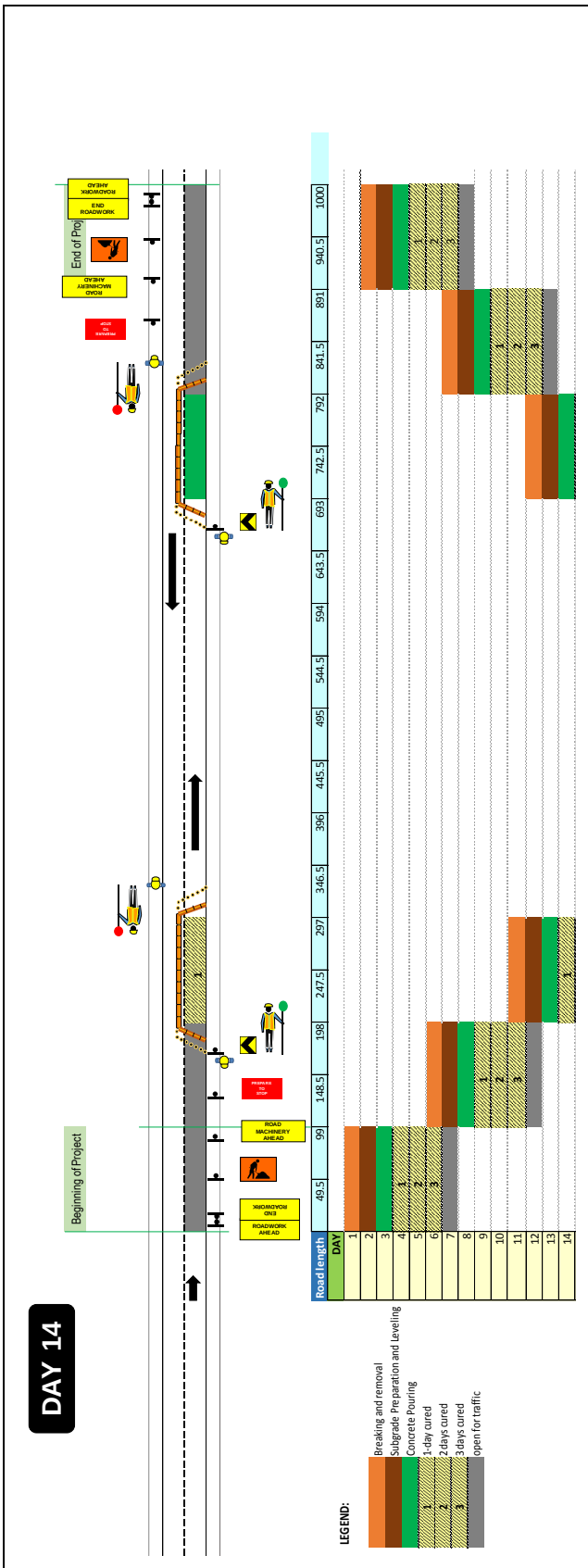


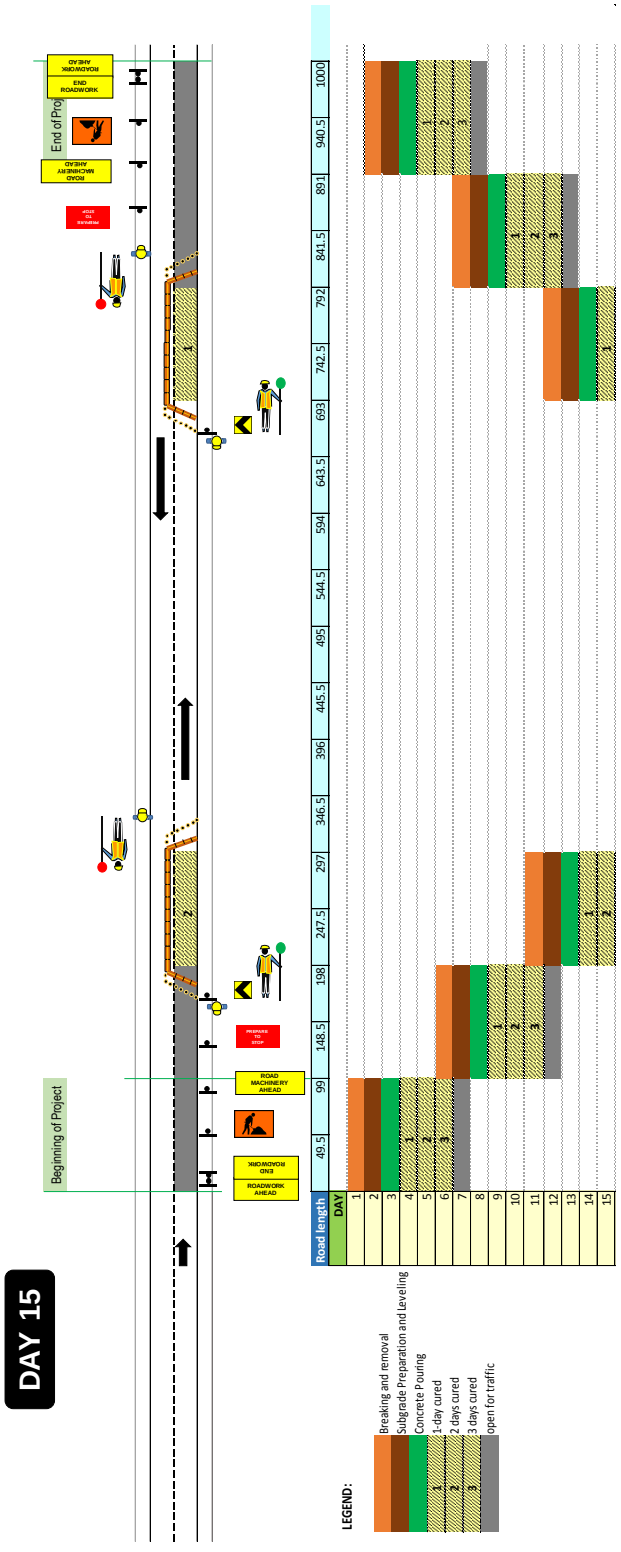
Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4	1																			
5	2																			
6	3																			
7																				
8																				
9			1																	
10			2																	
11			3																	

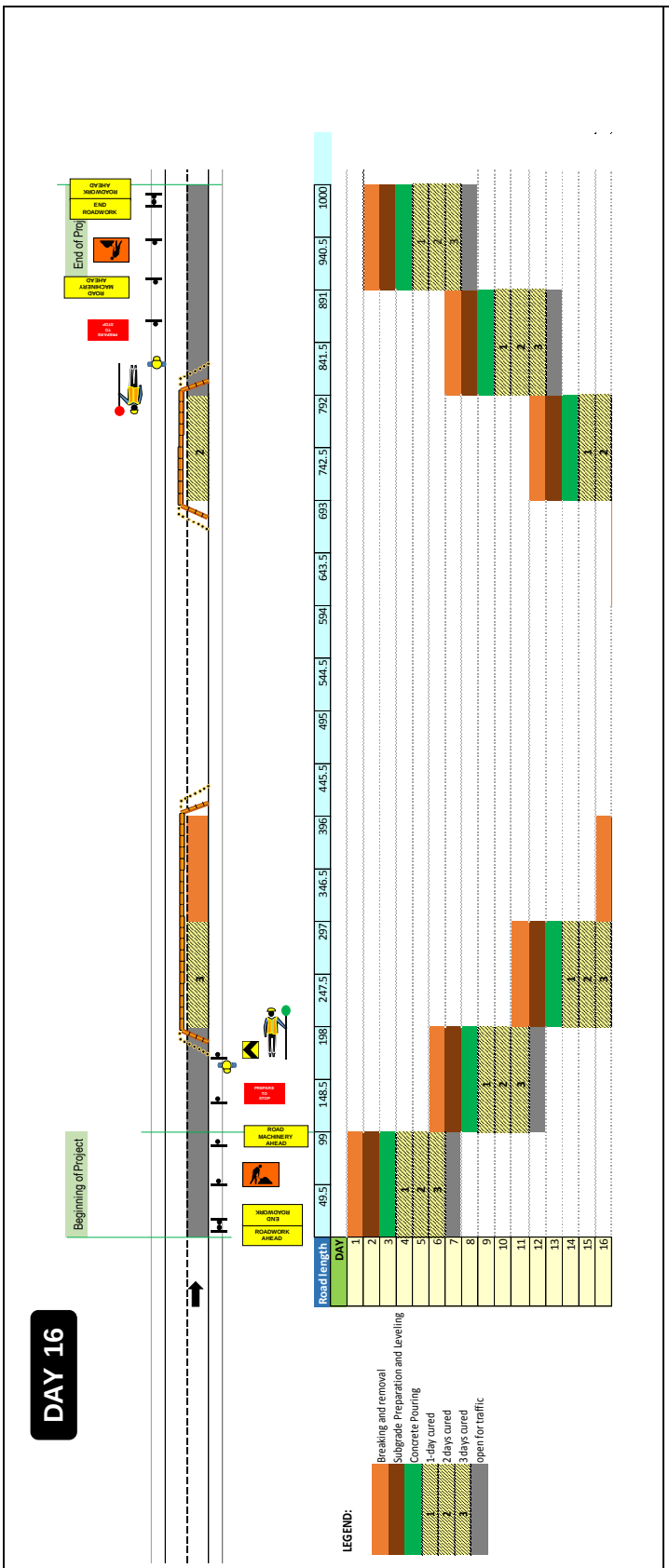
LEGEND:

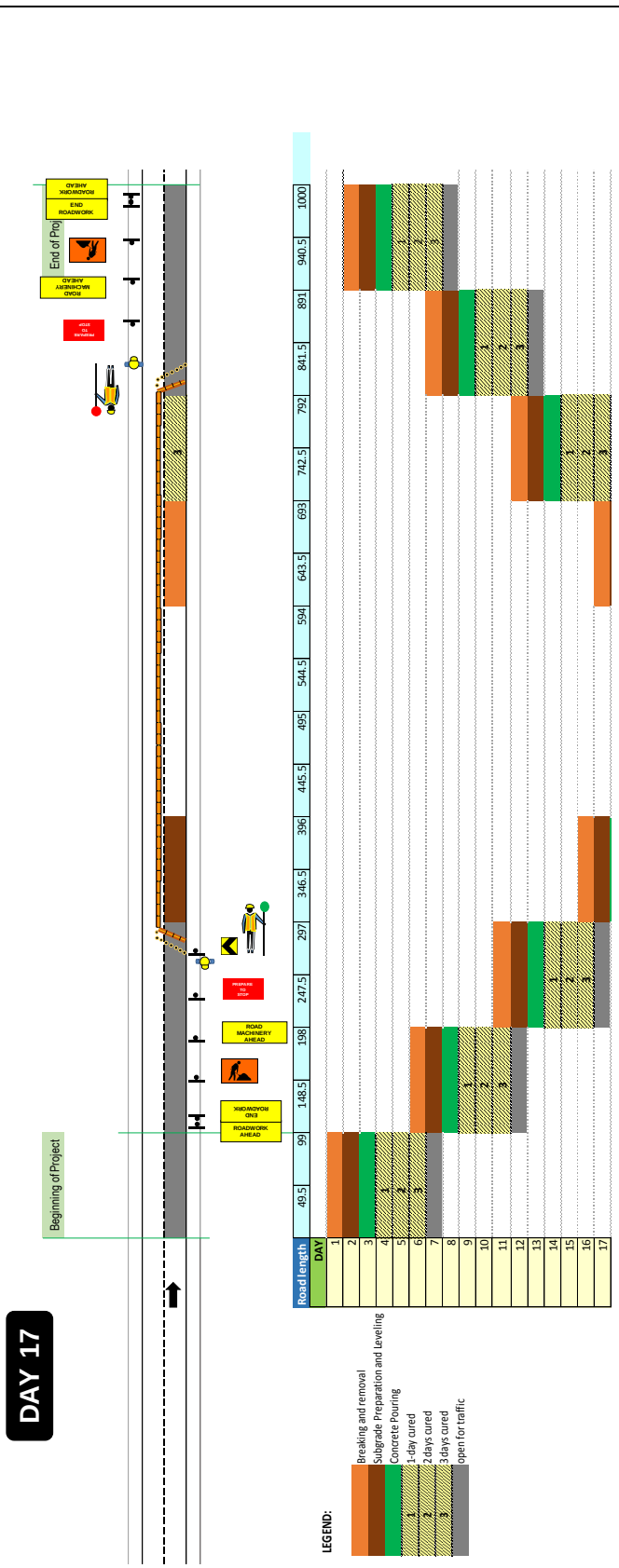
- Breaking and removal
- Subgrade Preparation and Leveling
- Concrete Pouring
- 1 — 1-day cured
- 2 — 2 days cured
- 3 — 3 days cured
- open for traffic

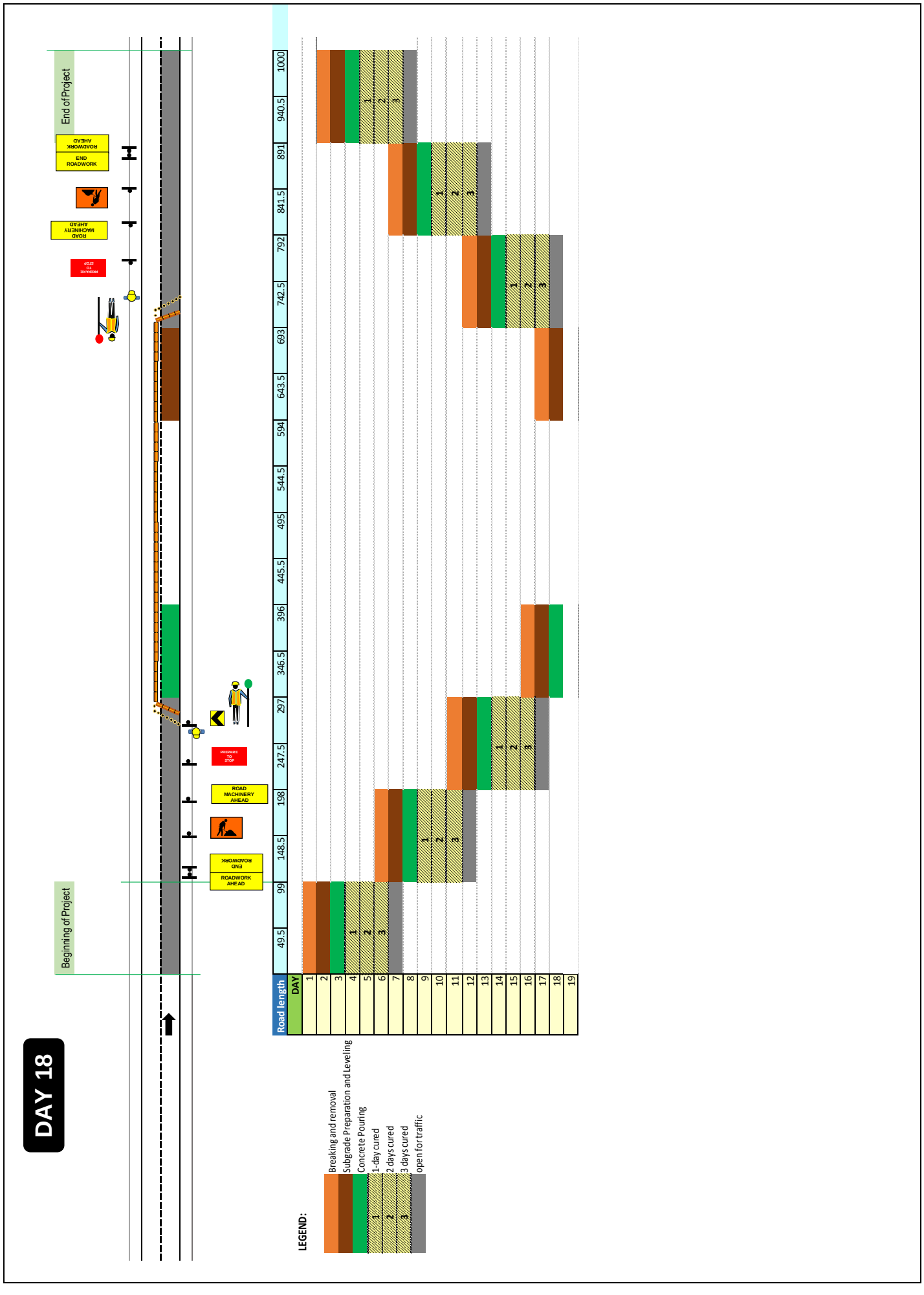

DAY 12
Beginning of Project
End of Project
ROAD MACHINERY AHEAD
PREPARE TO STOP
ROADWORK END
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic
DAY 13
Beginning of Project
End of Project
ROAD MACHINERY AHEAD
PREPARE TO STOP
ROADWORK END
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic

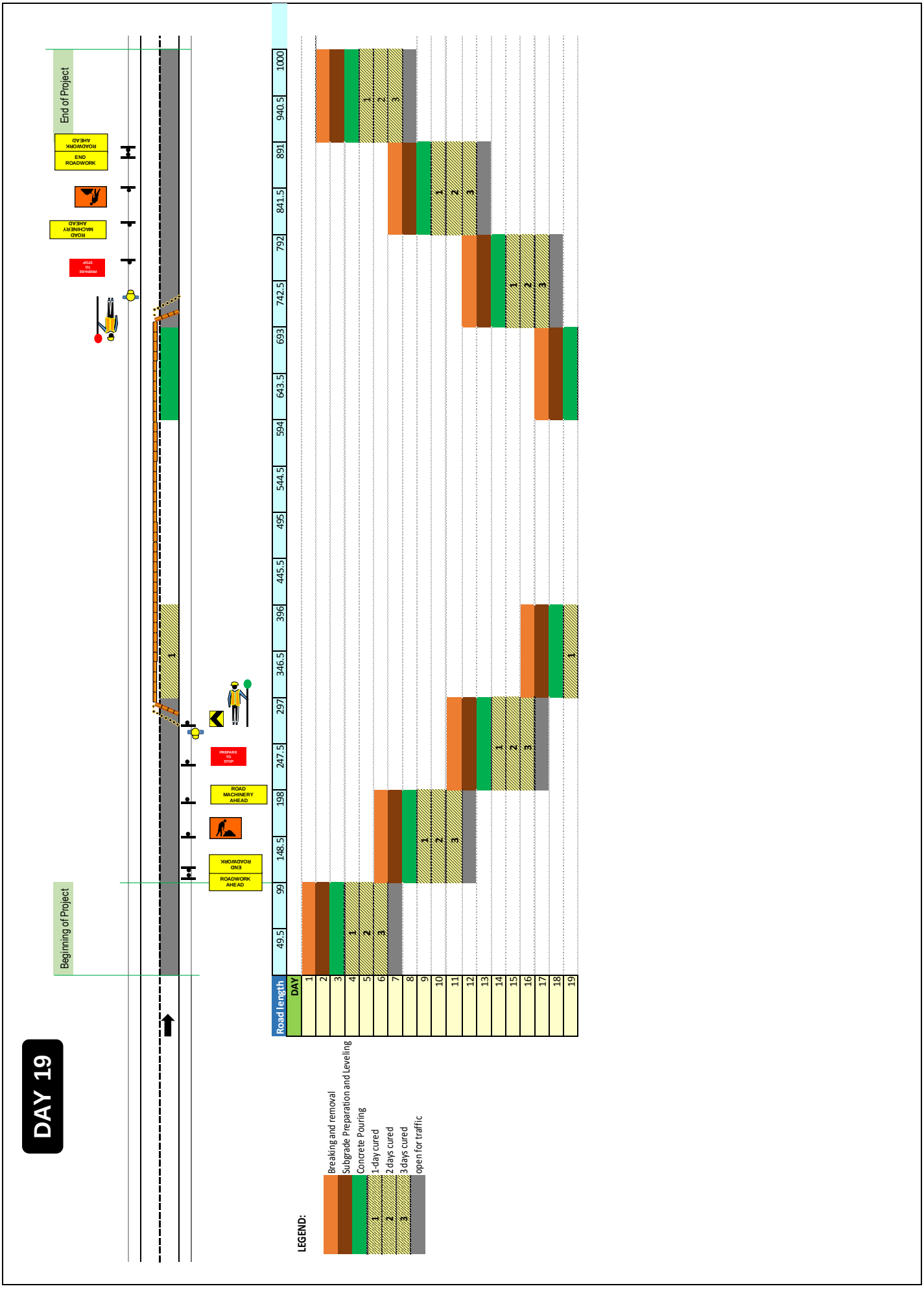

DAY 14
Beginning of Project
End of Project
ROAD MACHINERY AHEAD
ROADWORK END
ROADWORK AHEAD
PREPARE TO STOP
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic

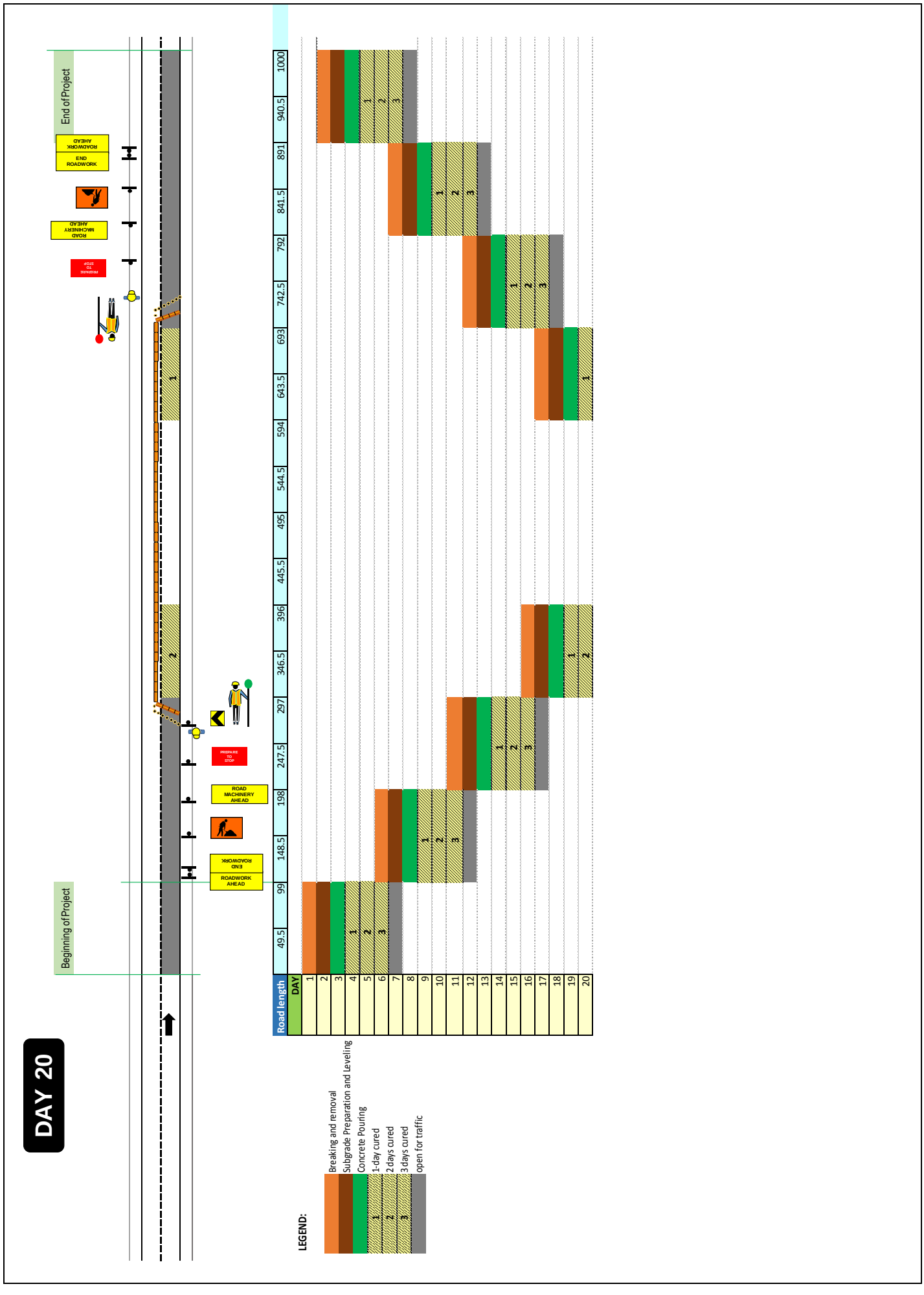

DAY 15
Beginning of Project
End of Project
ROAD MACHINERY AHEAD
ROADWORK END
ROADWORK AHEAD
PREPARE TO STOP
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic

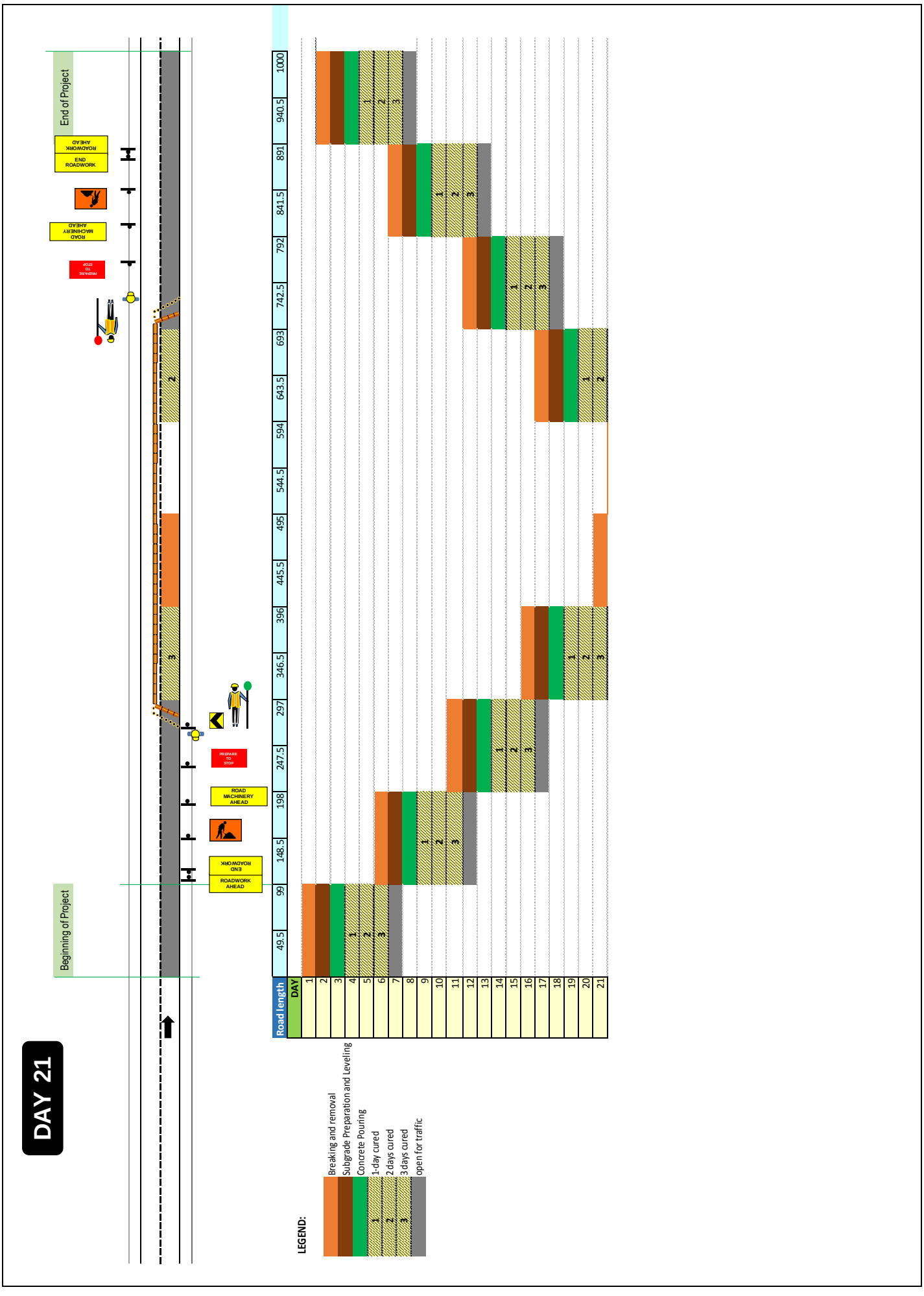

DAY 16
Beginning of Project
End of Project
ROADWORK AHEAD
ROAD MACHINERY AHEAD
PREPARE TO STOP
ROADWORK END
Road length
DAY
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2days cured
3days cured
open for traffic


DAY 17
Beginning of Project
End of Project
ROADWORK AHEAD
ROAD MACHINERY AHEAD
PREPARE TO STOP
ROADWORK END
Road length
DAY
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2days cured
3days cured
open for traffic

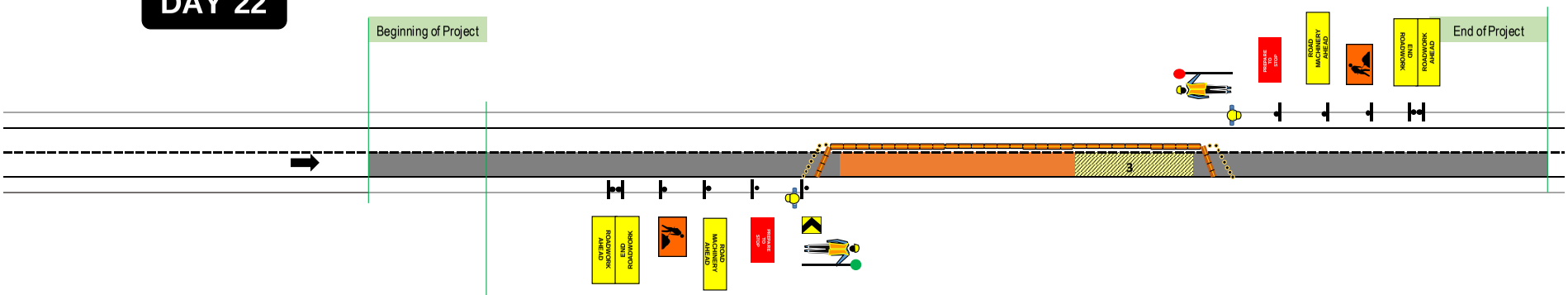

DAY 18
End of Project
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
Beginning of Project
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic


DAY 19
End of Project
Beginning of Project
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic


DAY 20
End of Project
Beginning of Project
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic


DAY 21
End of Project
Beginning of Project
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic

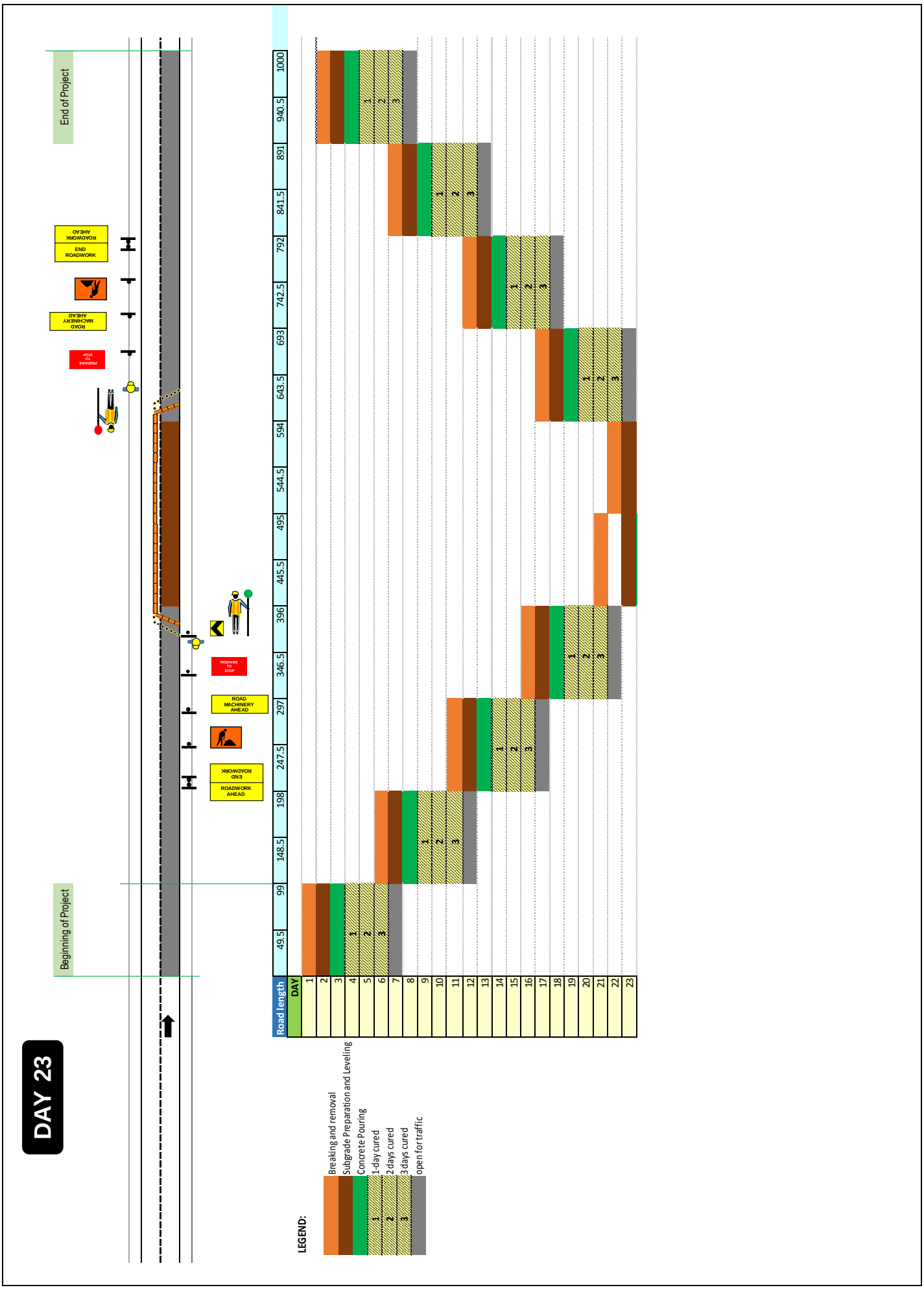
DAY 22



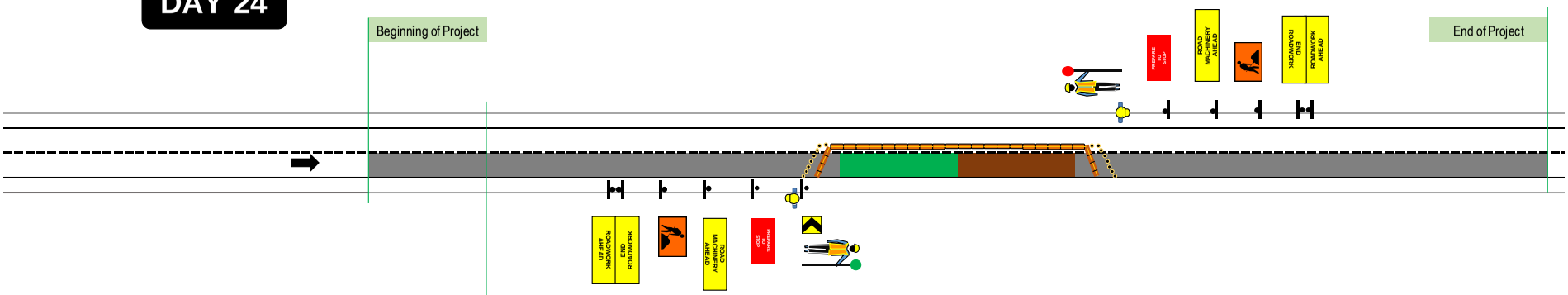
LEGEND:

- Breaking and removal
- Subgrade Preparation and Leveling
- Concrete Pouring
- 1 — 1-day cured
- 2 — 2 days cured
- 3 — 3 days cured
- open for traffic

Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4	1																			
5	2																			
6	3																			
7																				
8																				
9			1																	
10			2																	
11			3																	
12																				
13																				
14					1															
15					2															
16					3															
17																				
18																				
19							1													
20							2													
21							3													
22																				


DAY 23
End of Project
Beginning of Project
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic

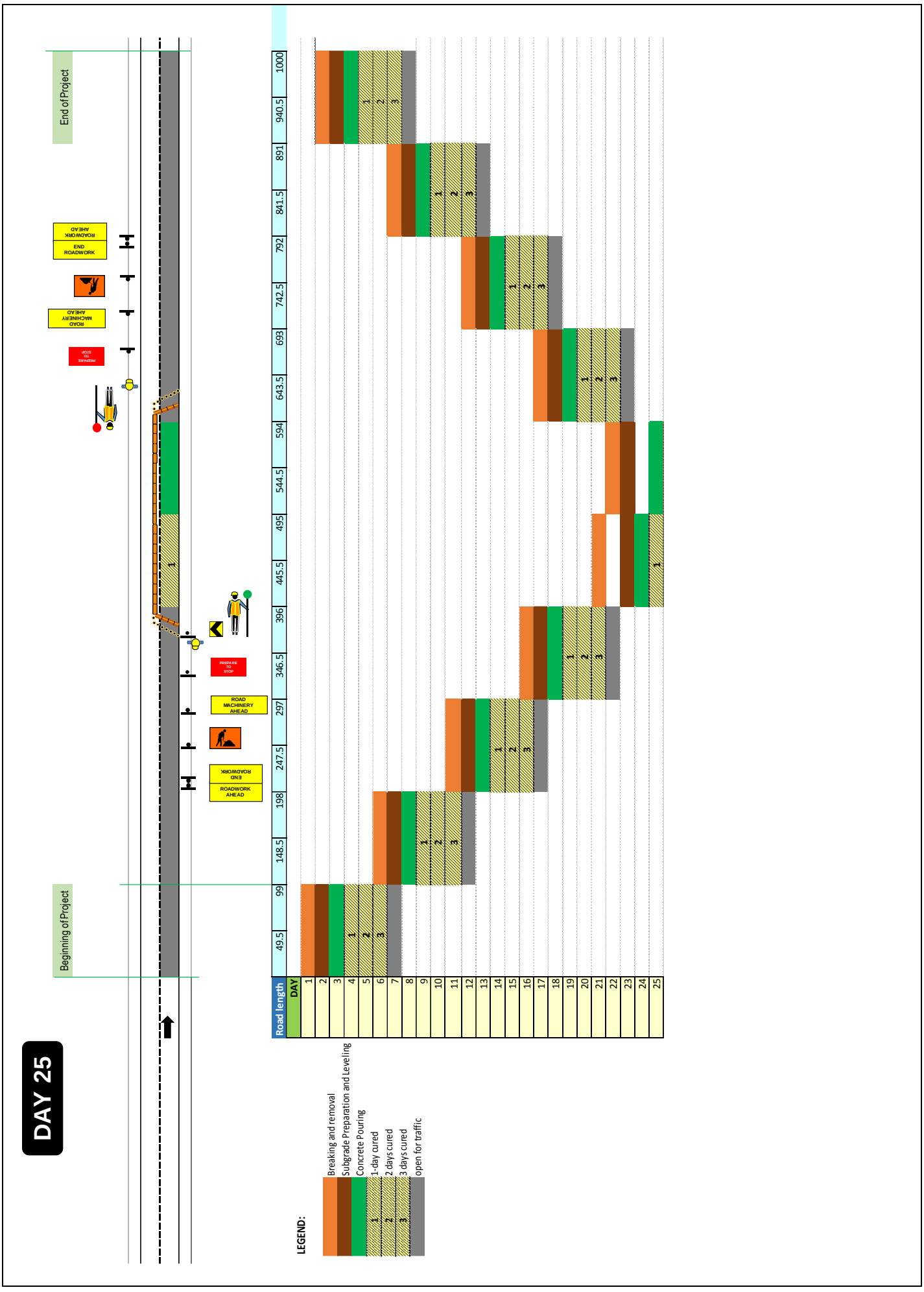
DAY 24

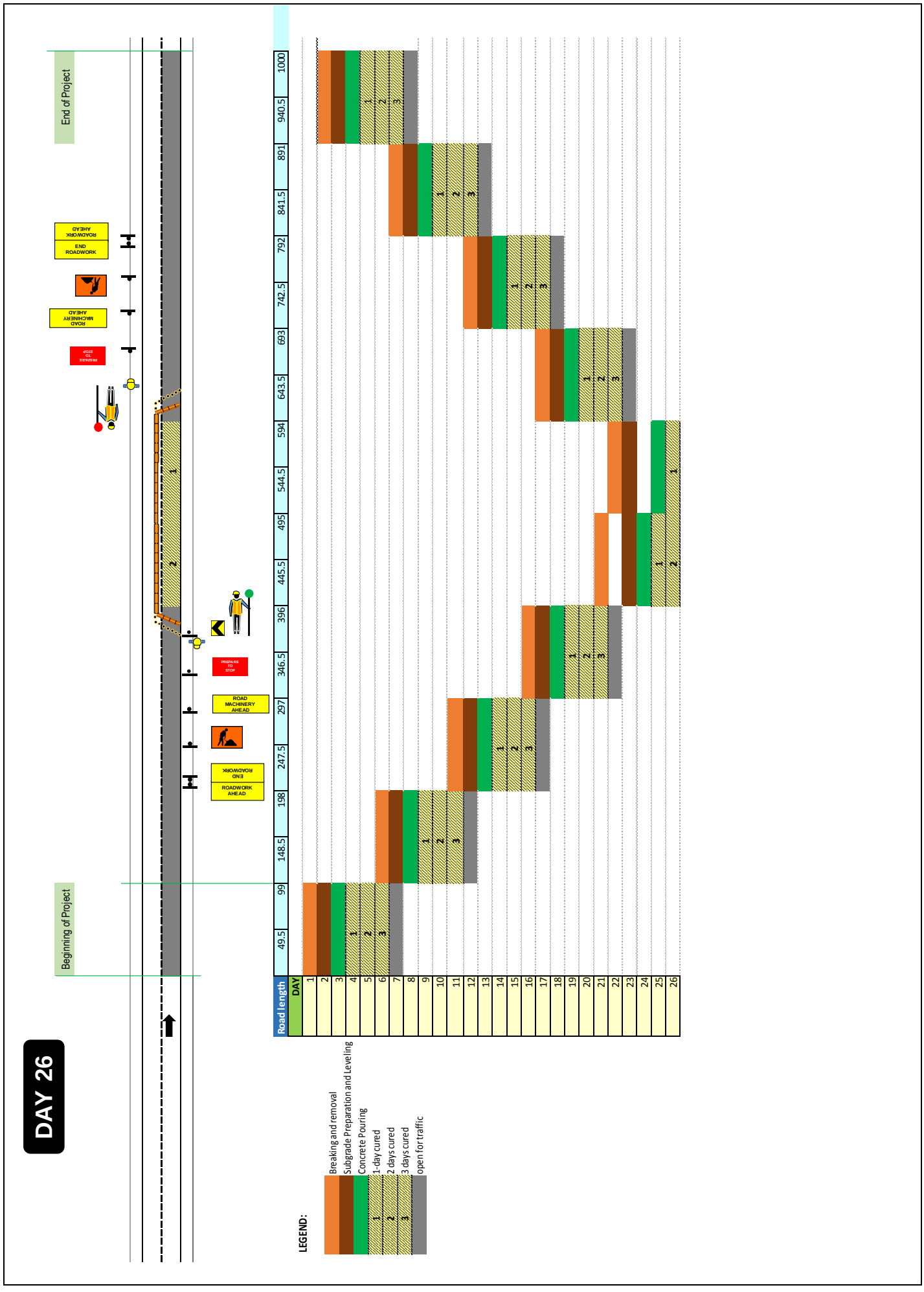


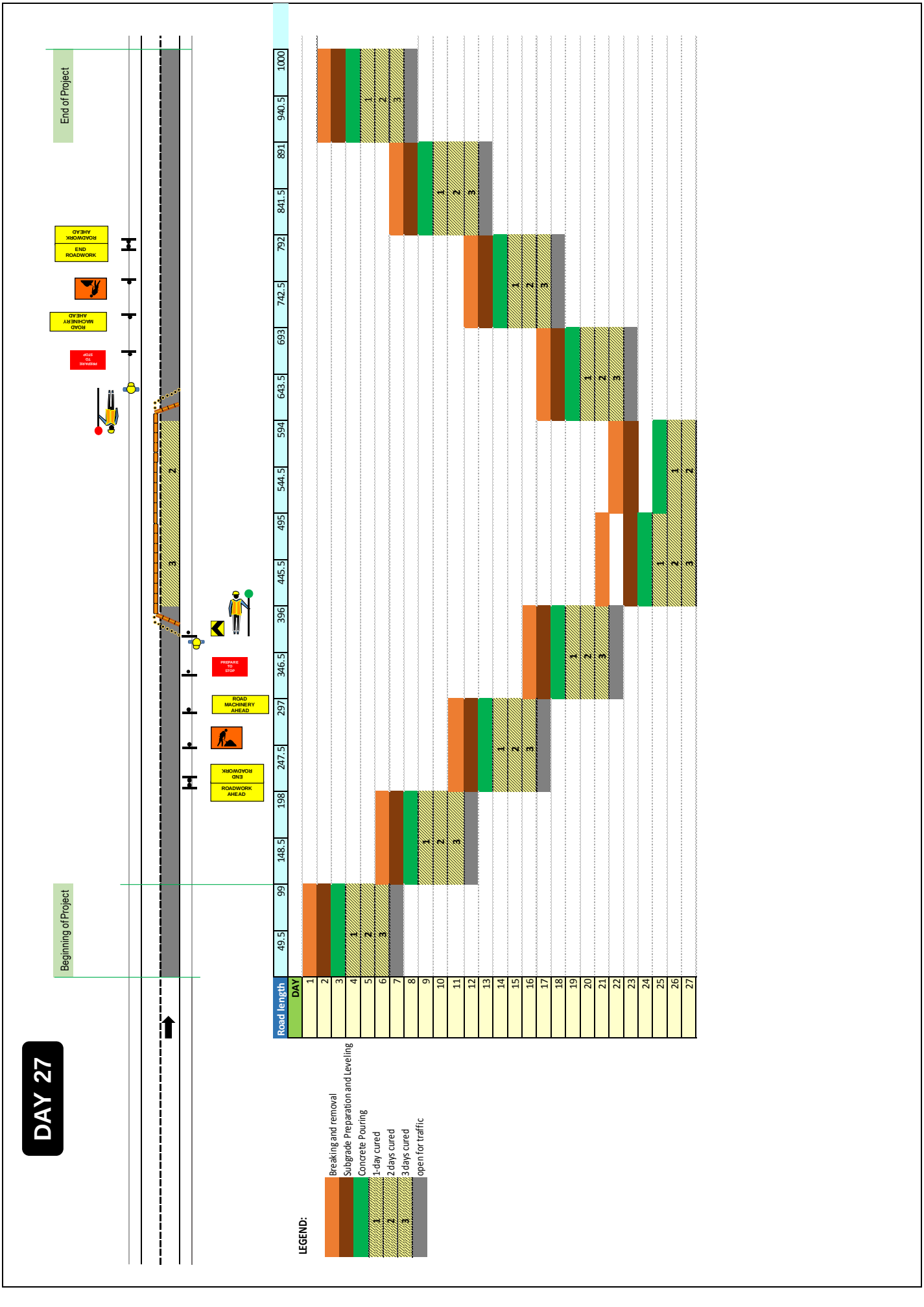
LEGEND:

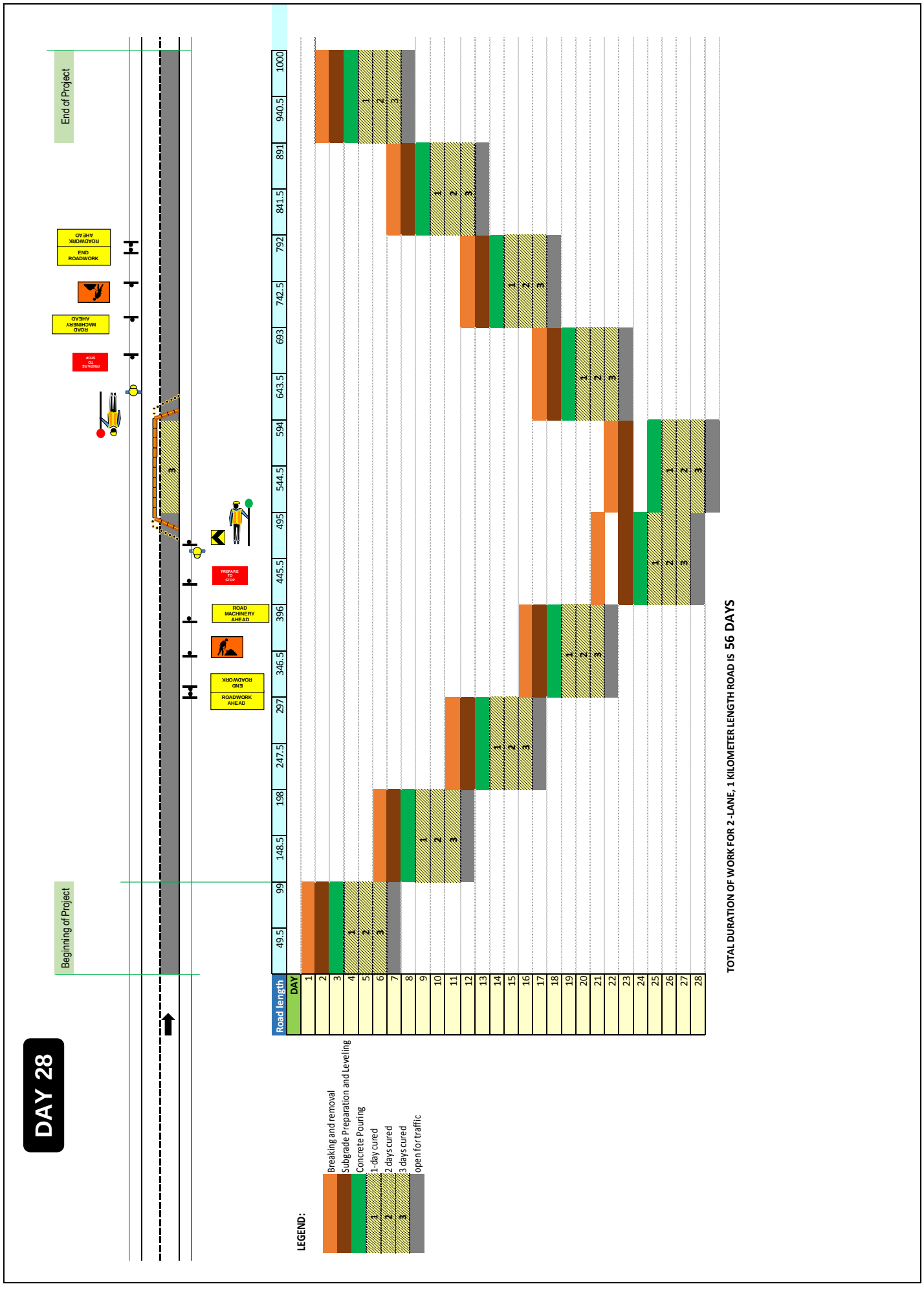
- Breaking and removal
- Subgrade Preparation and Leveling
- Concrete Pouring
- 1 — 1-day cured
- 2 — 2 days cured
- 3 — 3 days cured
- open for traffic

Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4	1																			
5	2																			
6	3																			
7																				
8																				
9			1																	
10			2																	
11			3																	
12																				
13																				
14					1															
15					2															
16					3															
17																				
18																				
19							1													
20							2													
21							3													
22																				
23																				
24																				


DAY 25
End of Project
Beginning of Project
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic


DAY 26
End of Project
Beginning of Project
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic


DAY 27
End of Project
Beginning of Project
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic


DAY 28
End of Project
Beginning of Project
ROADWORK AHEAD
END ROADWORK
ROAD MACHINERY AHEAD
PREPARE TO STOP
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
LEGEND:
Breaking and removal
Subgrade Preparation and Leveling
Concrete Pouring
1-day cured
2 days cured
3 days cured
open for traffic
TOTAL DURATION OF WORK FOR 2 -LANE, 1 KILOMETER LENGTH ROAD IS 56 DAYS

DETAILED UNIT PRICE ANALYSIS

ITEM NO/DESCRIPTION : **B.8 Roadworks Safety & Traffic Management**
UNIT OF MEASUREMENT : lot
QUANTITY : 1 lot (for 56 C.D)

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Speed Restriction (R4-1)	each-day	4.00	4.73	18.90
Roadwork Ahead (T1-1)	each-day	4.00	10.95	43.81
End Roadwork (T2-16)	each-day	4.00	10.95	43.81
End Speed Restriction (R4-2)	each-day	4.00	4.73	18.90
Workmen Ahead (T1-5)	each-day	4.00	5.64	22.56
Prepare to Stop (T1-18)	each-day	2.00	5.64	11.28
Temporary Hazard Marker (Chevron, T5-5)	each-day	1.00	5.76	5.76
Road Machinery (T1-3)	each-day	2.00	6.54	13.09
* Temporary Bollards (@ 5 meters apart)	each-day	32.00	1.64	52.60
* Plastic Safety Barriers	each-day	320.00	2.74	876.71
Safety Vest	man-day	2.00	1.11	2.22
Hard Hat	man-day	2.00	0.27	0.55
Safety Shoes	man-day	2.00	3.29	6.58

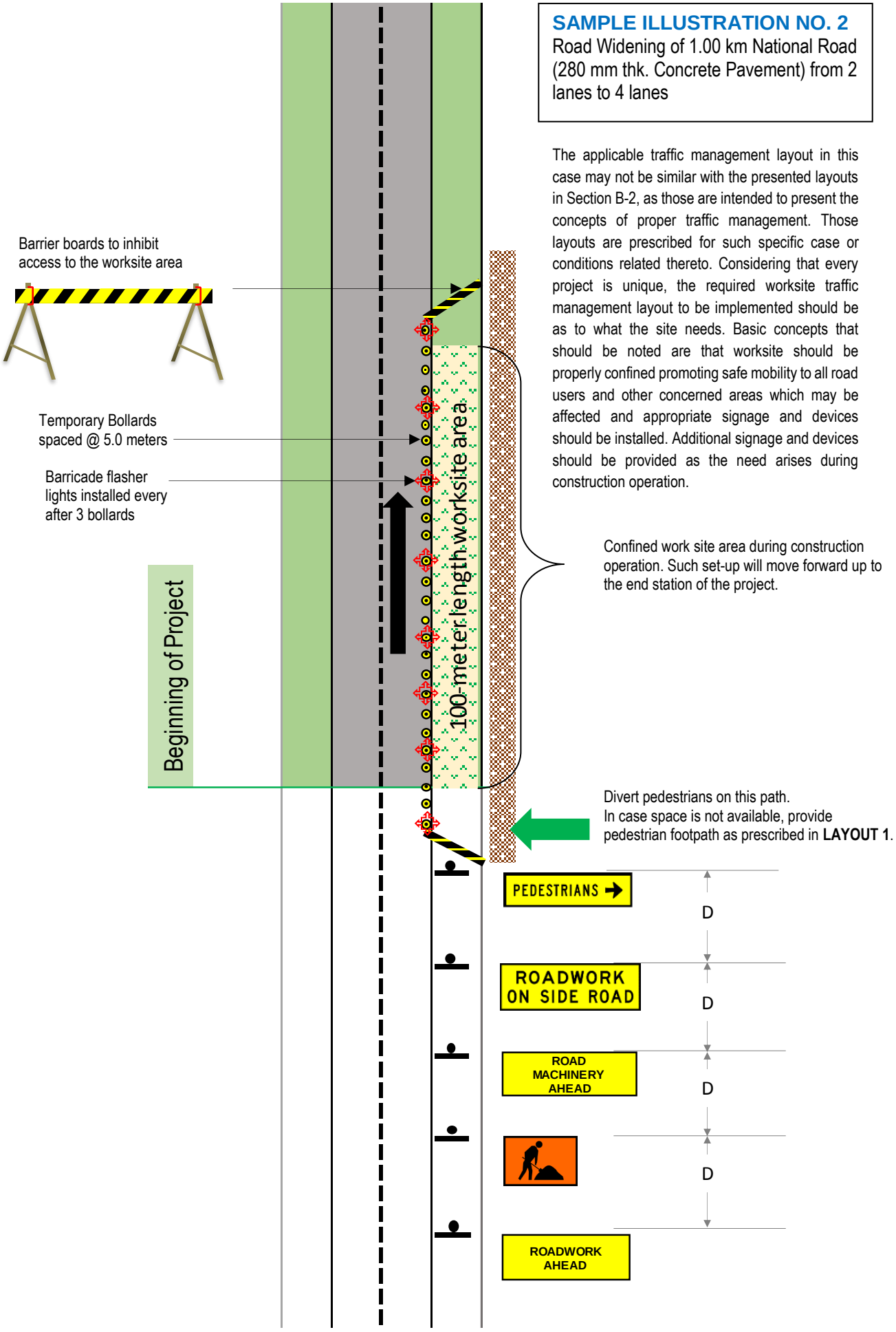
Note: For estimation purposes, approach speed (equal to "D" in meters) is 40 kph.

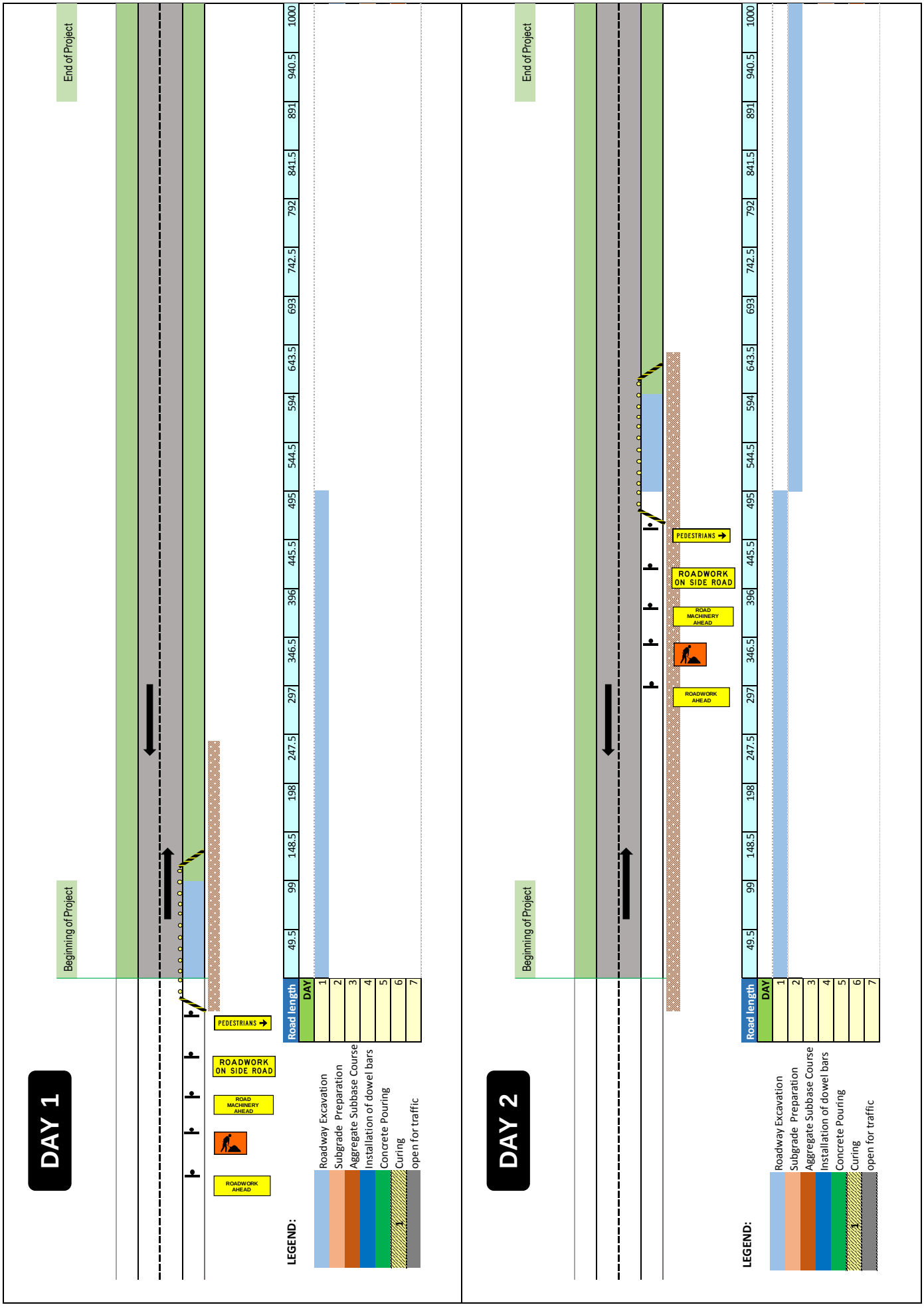
SUB - TOTAL (A)				**1,116.76**
B. LABOR COST	**QUANTITY**		**Unit**	**Total**
	No. of Personnel	**Total Hours**	**Rate**	**Cost**
Traffic Controller	4.00	8.00	70.74	2,263.68
SUB - TOTAL (B)				**2,263.68**
C. EQUIPMENT COST	**QUANTITY**		**Hourly**	**Total**
	No. of Equipt.	**Total Hours**	**Rate**	**Cost**
Two-way Radio	4.00	8.00	2.60	83.34
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color)	33.00	12.00	0.65	257.96
SUB - TOTAL (C)				**341.30**
D. TOTAL DIRECT COST (A + B + C)				3,721.75
E. DIRECT UNIT COST (D/Quantity)				66.46
F. ADD: INDIRECT COST				
1. OCM (9% of D)				
2. Contractor's Profit (8% of D)			297.74	
3. VAT 12%			482.34	
** TOTAL INDIRECT COST				780.08
TOTAL COST (D + F)				4,501.81
TOTAL RENTAL UNIT COST (PER DAY)				4,501.81
Total cost for the whole duration of the project =				252,101.58

** *Mark-up percentage varies depending on the total Direct Cost of the project per D.O. 22, Series 2015*

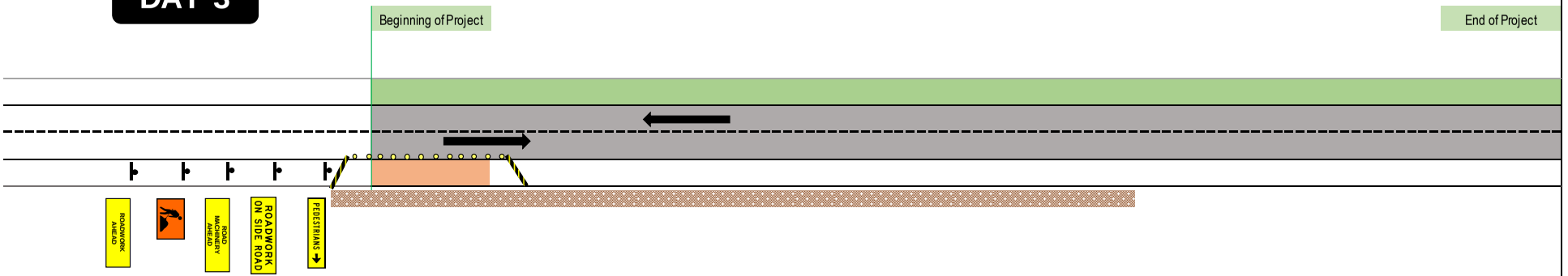
SAMPLE ILLUSTRATION NO. 2
Road Widening of 1.00 km National Road (280 mm thk. Concrete Pavement) from 2 lanes to 4 lanes

The applicable traffic management layout in this case may not be similar with the presented layouts in Section B-2, as those are intended to present the concepts of proper traffic management. Those layouts are prescribed for such specific case or conditions related thereto. Considering that every project is unique, the required worksite traffic management layout to be implemented should be as to what the site needs. Basic concepts that should be noted are that worksite should be properly confined promoting safe mobility to all road users and other concerned areas which may be affected and appropriate signage and devices should be installed. Additional signage and devices should be provided as the need arises during construction operation.




DAY 1
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5 99 148.5 198 247.5 297 346.5 396 445.5 495 544.5 594 643.5 693 742.5 792 841.5 891 940.5 1000
1 2 3 4 5 6 7
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic
DAY 2
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5 99 148.5 198 247.5 297 346.5 396 445.5 495 544.5 594 643.5 693 742.5 792 841.5 891 940.5 1000
1 2 3 4 5 6 7
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic

DAY 3

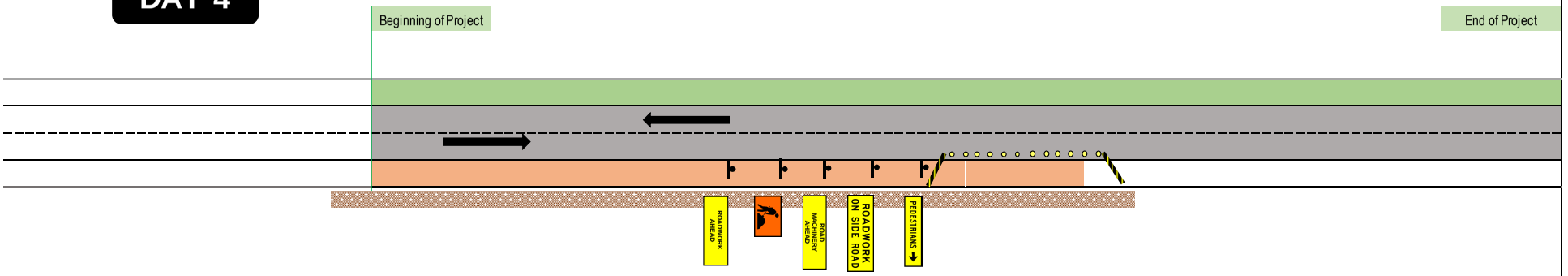


LEGEND:

- Roadway Excavation
- Subgrade Preparation
- Aggregate Subbase Course
- Installation of dowel bars
- Concrete Pouring
- Curing
- open for traffic

Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				

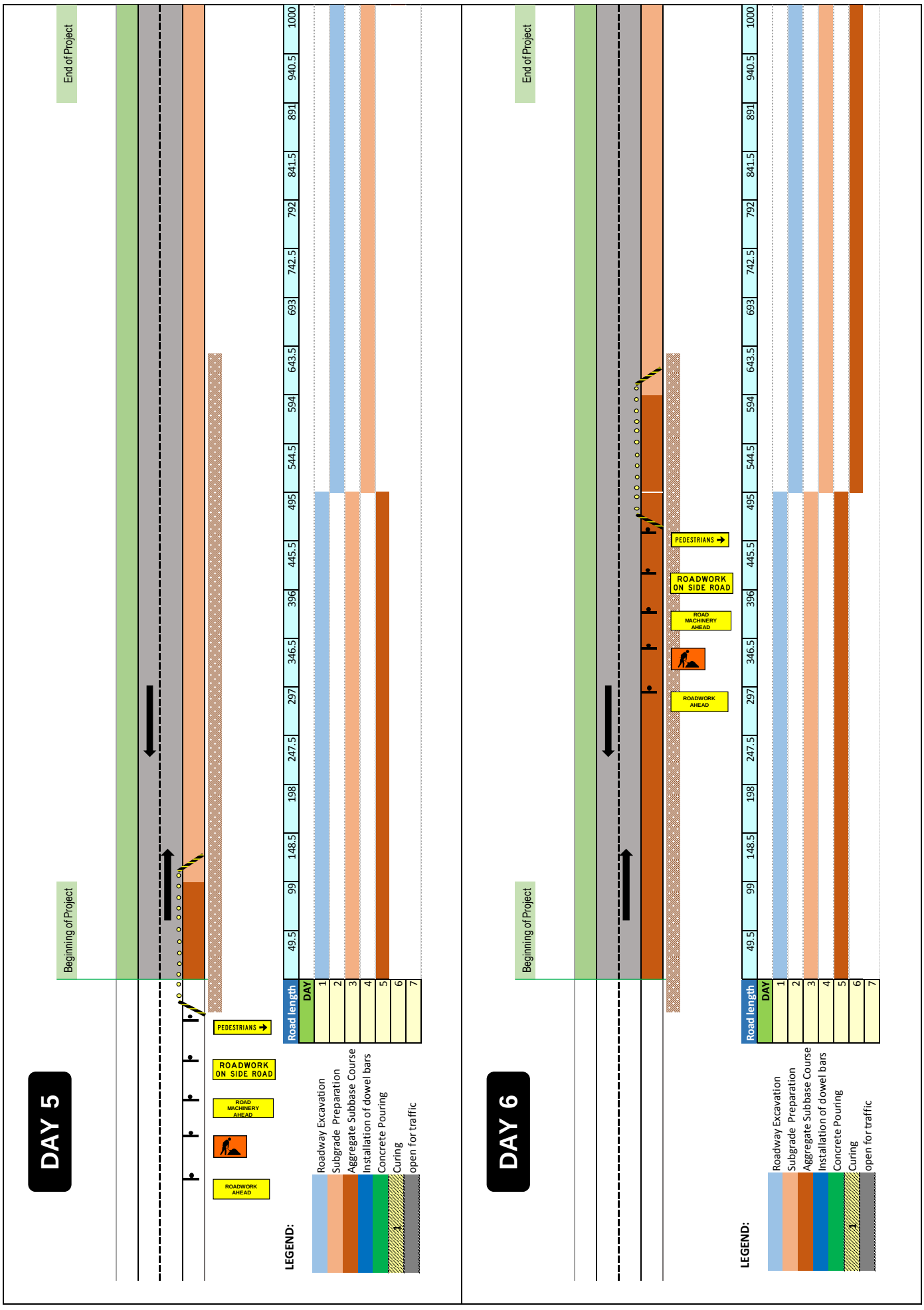
DAY 4



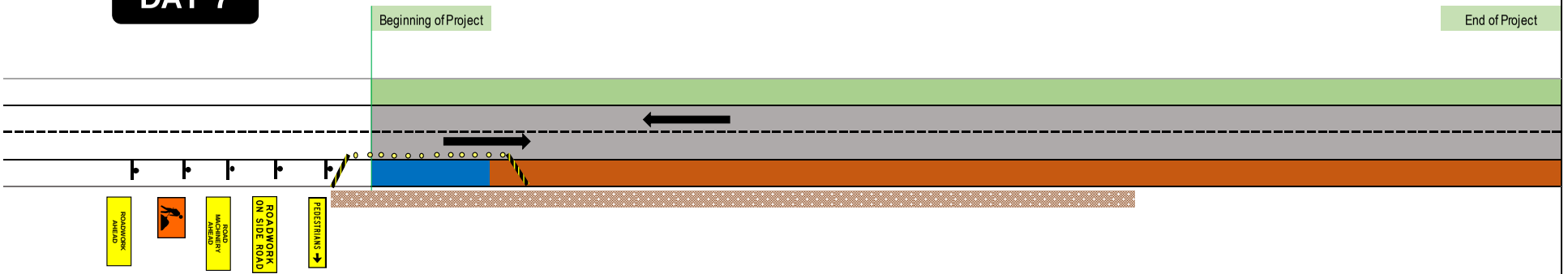
LEGEND:

- Roadway Excavation
- Subgrade Preparation
- Aggregate Subbase Course
- Installation of dowel bars
- Concrete Pouring
- Curing
- open for traffic

Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				


DAY 5
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
DAY
1
2
3
4
5
6
7
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic
DAY 6
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
DAY
1
2
3
4
5
6
7
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic

DAY 7

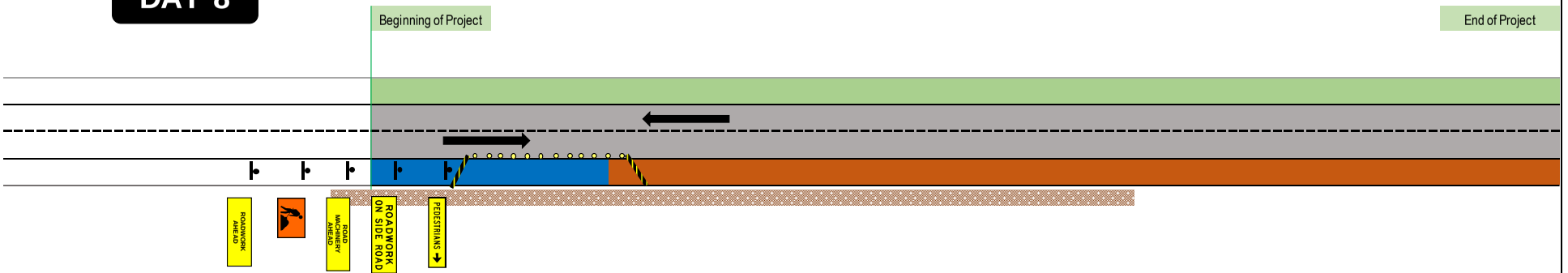


LEGEND:

- Roadway Excavation
- Subgrade Preparation
- Aggregate Subbase Course
- Installation of dowel bars
- Concrete Pouring
- Curing
- open for traffic

Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				

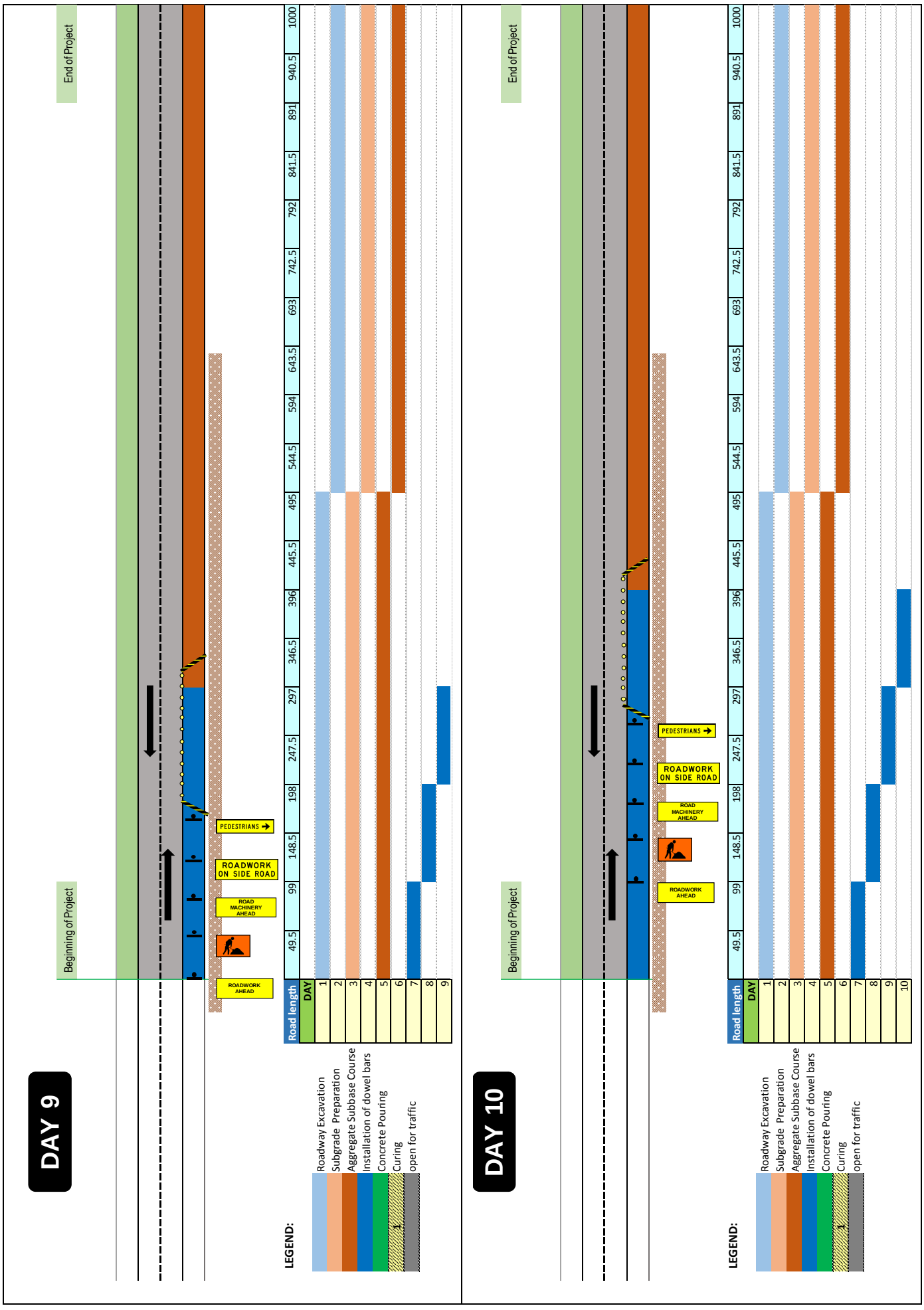
DAY 8



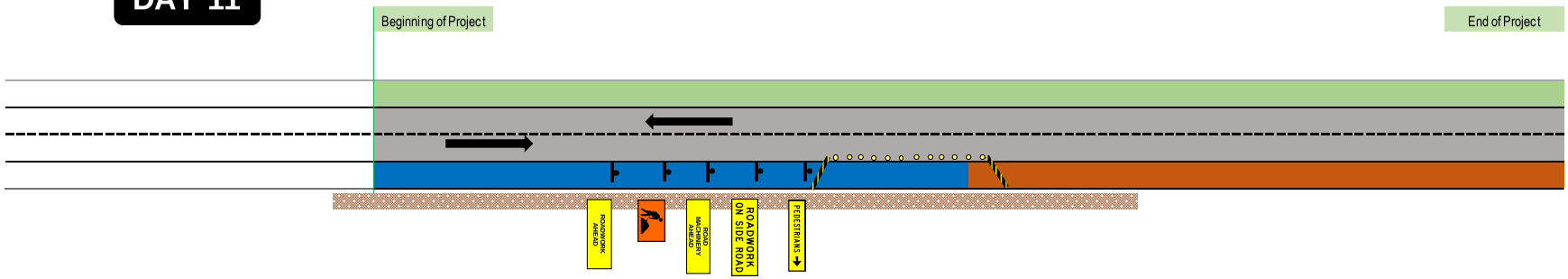
LEGEND:

- Roadway Excavation
- Subgrade Preparation
- Aggregate Subbase Course
- Installation of dowel bars
- Concrete Pouring
- Curing
- open for traffic

Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				


DAY 9
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
4
5
6
7
8
9
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic
DAY 10
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
4
5
6
7
8
9
10
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic

DAY 11

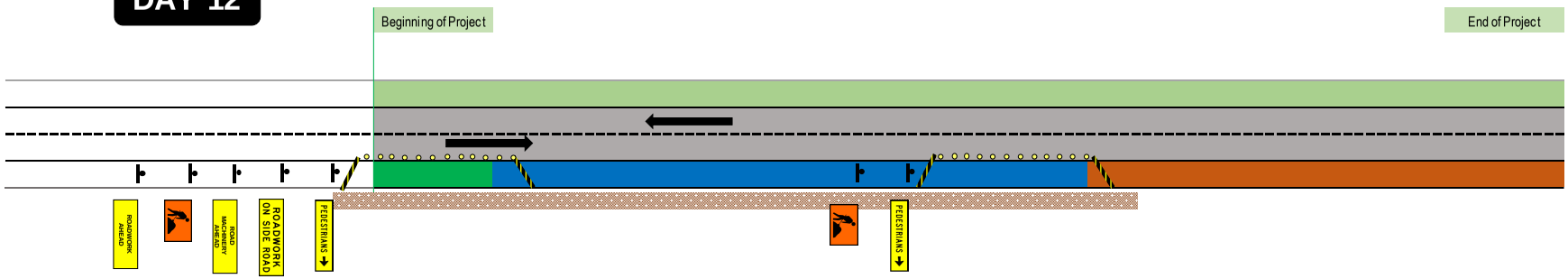


LEGEND:

- Roadway Excavation
- Subgrade Preparation
- Aggregate Subbase Course
- Installation of dowel bars
- Concrete Pouring
- 1 Curing
- open for traffic

Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				

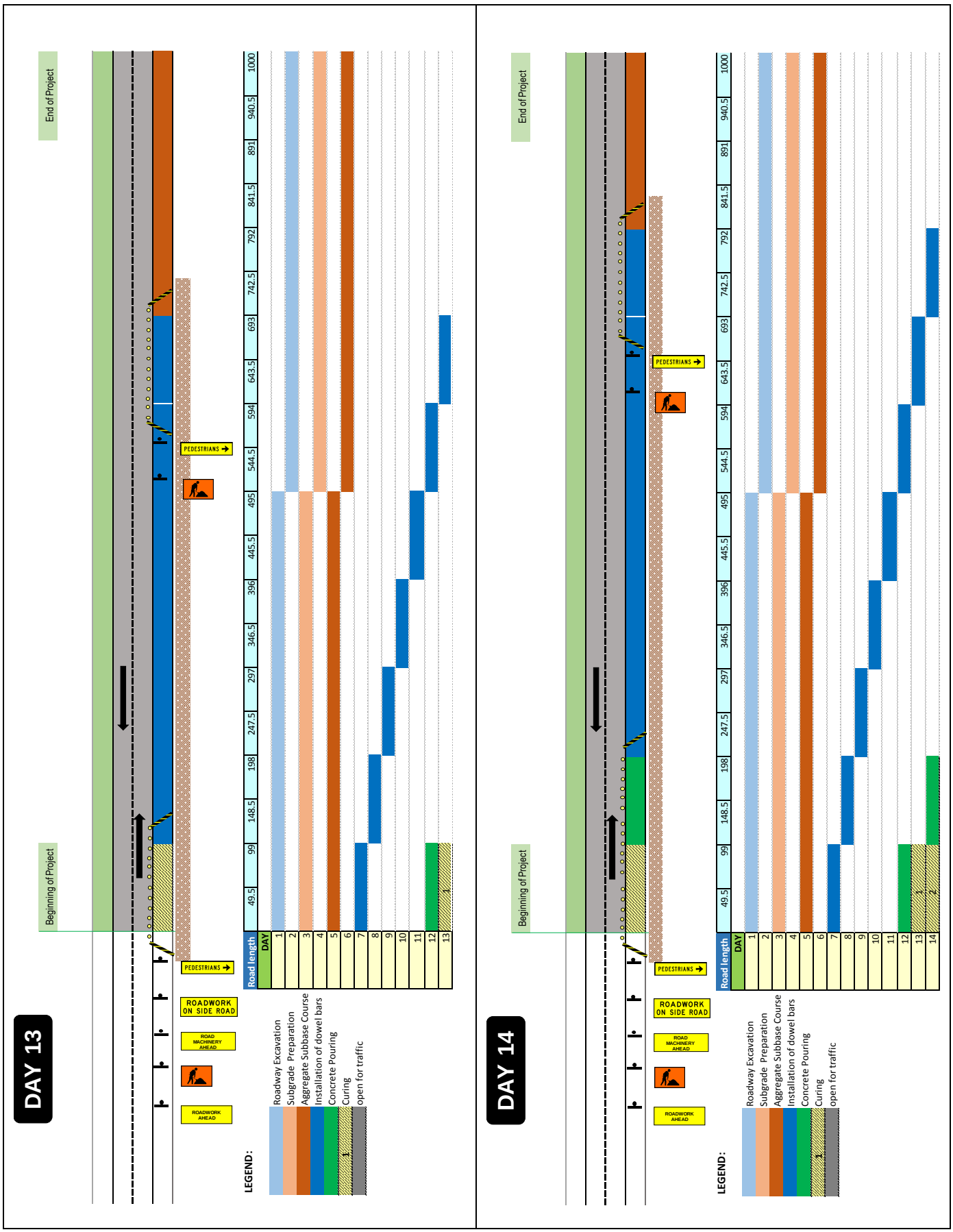
DAY 12

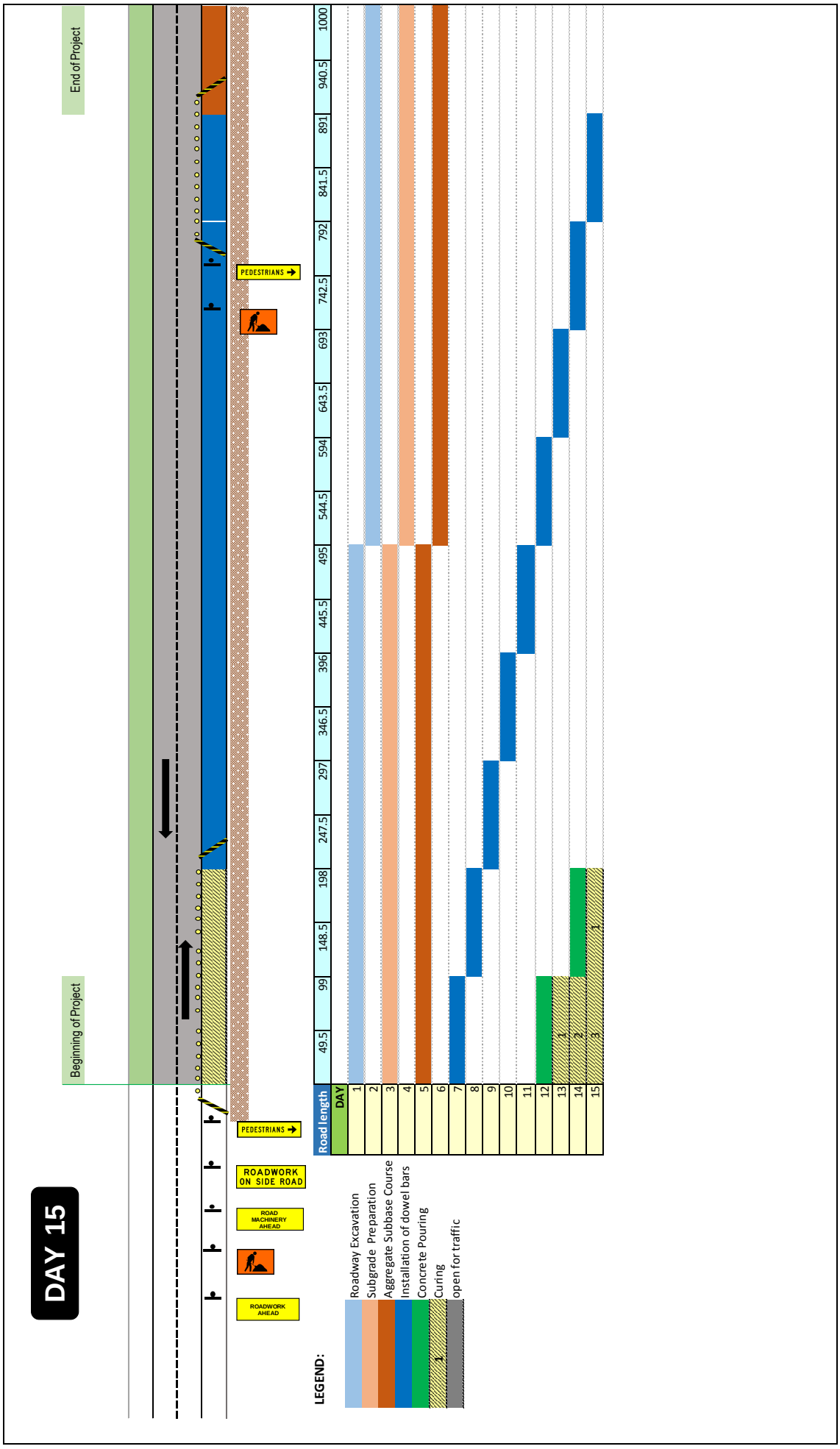


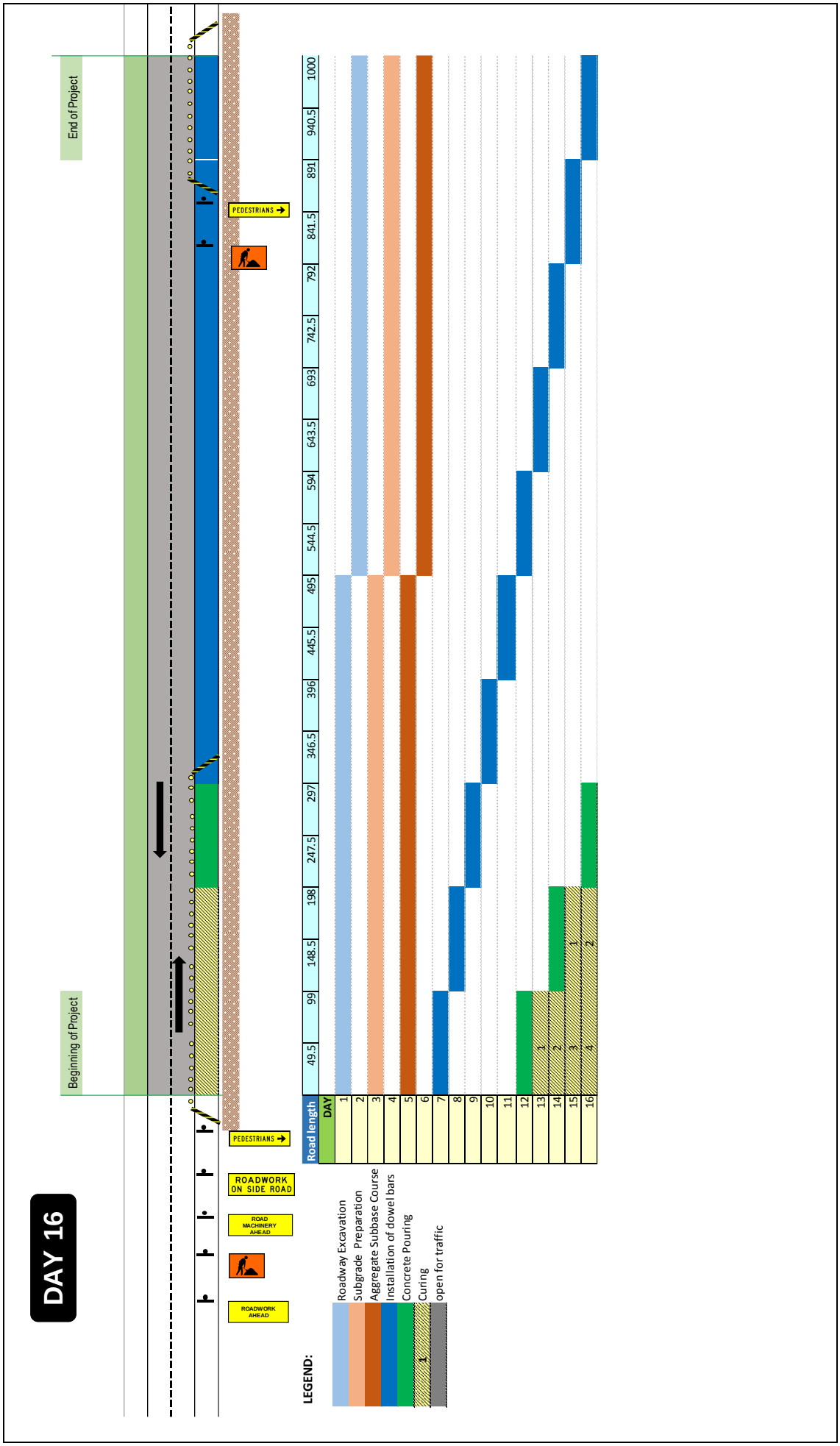
LEGEND:

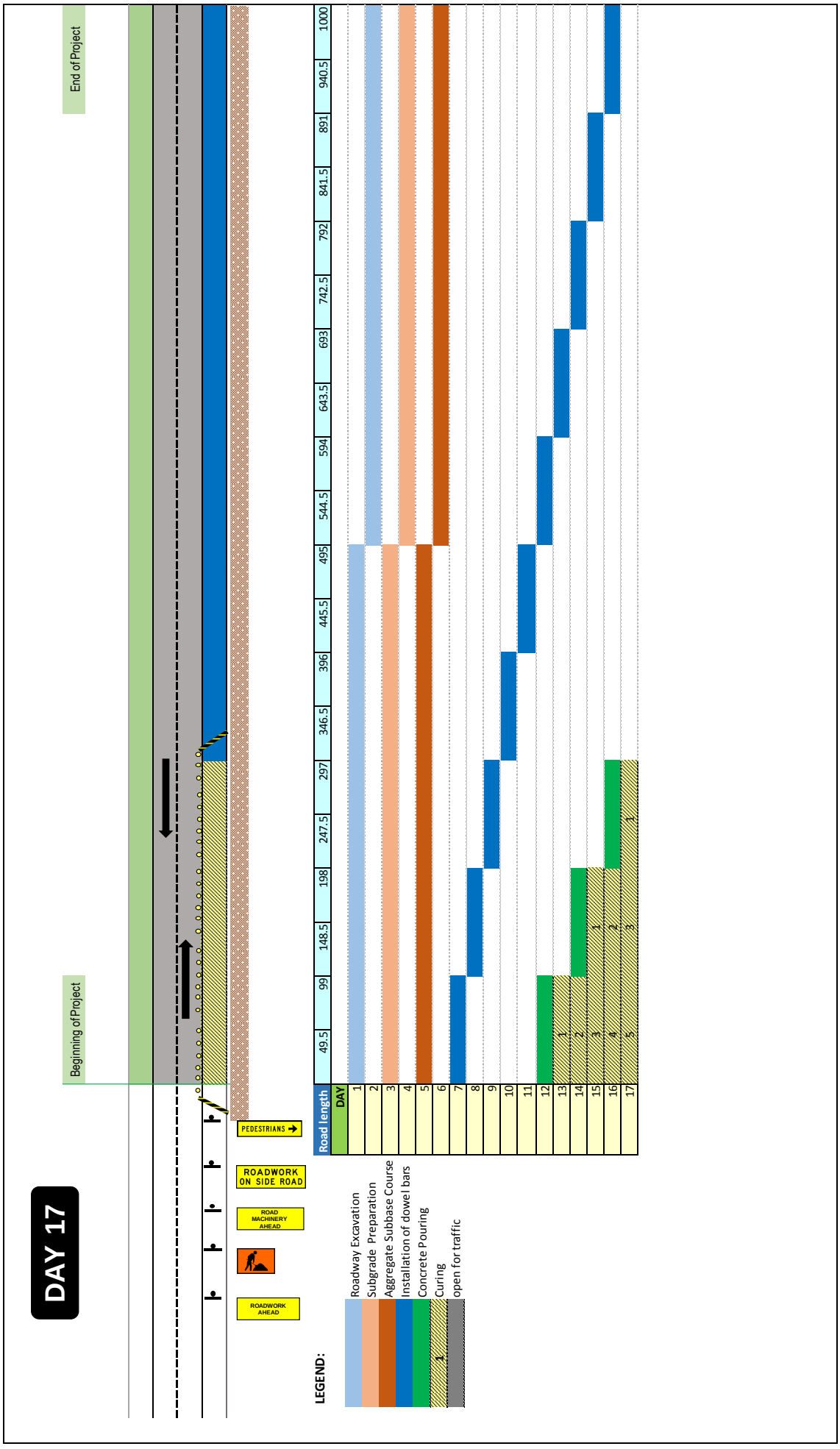
- Roadway Excavation
- Subgrade Preparation
- Aggregate Subbase Course
- Installation of dowel bars
- Concrete Pouring
- 1 Curing
- open for traffic

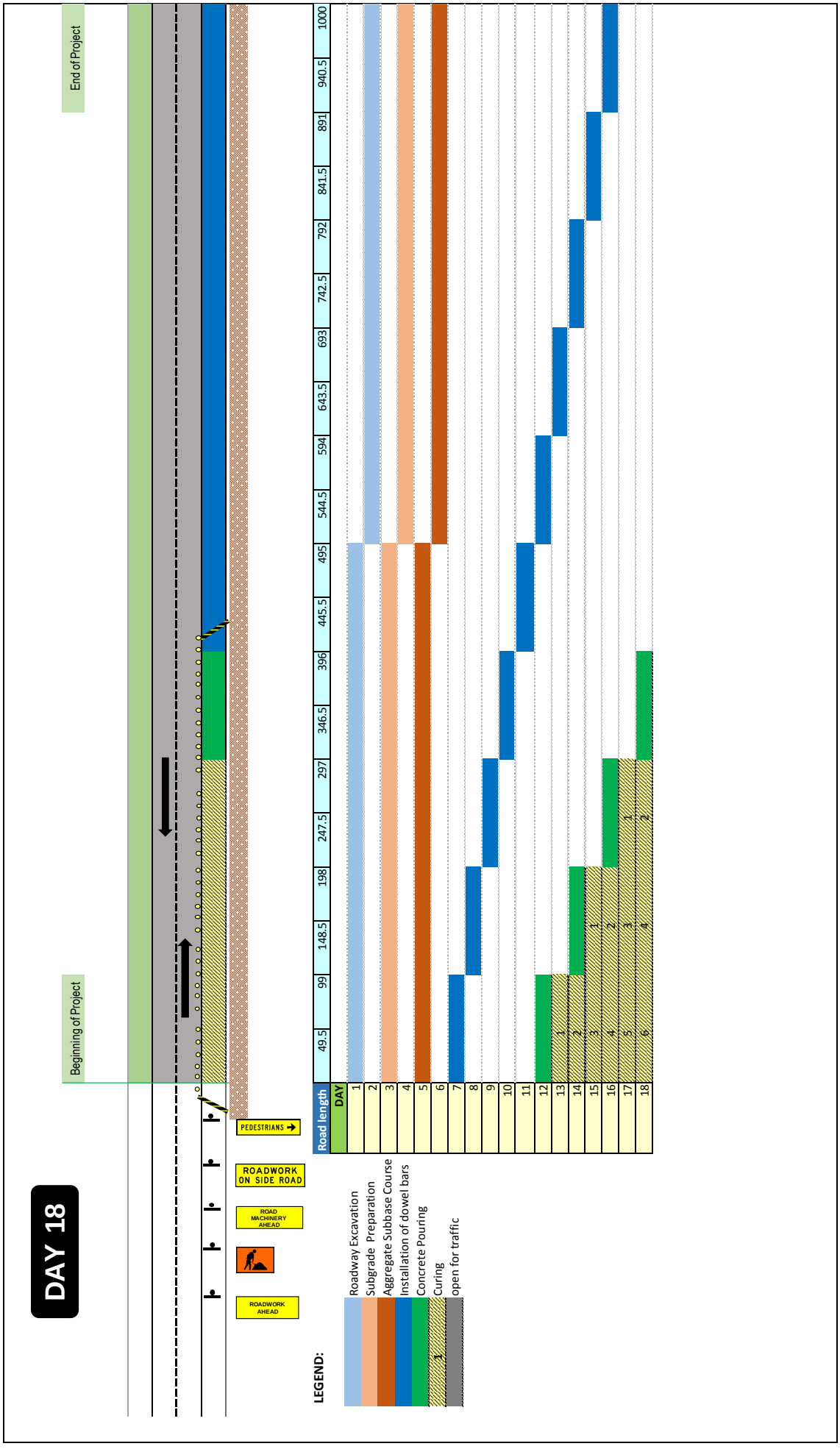
Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

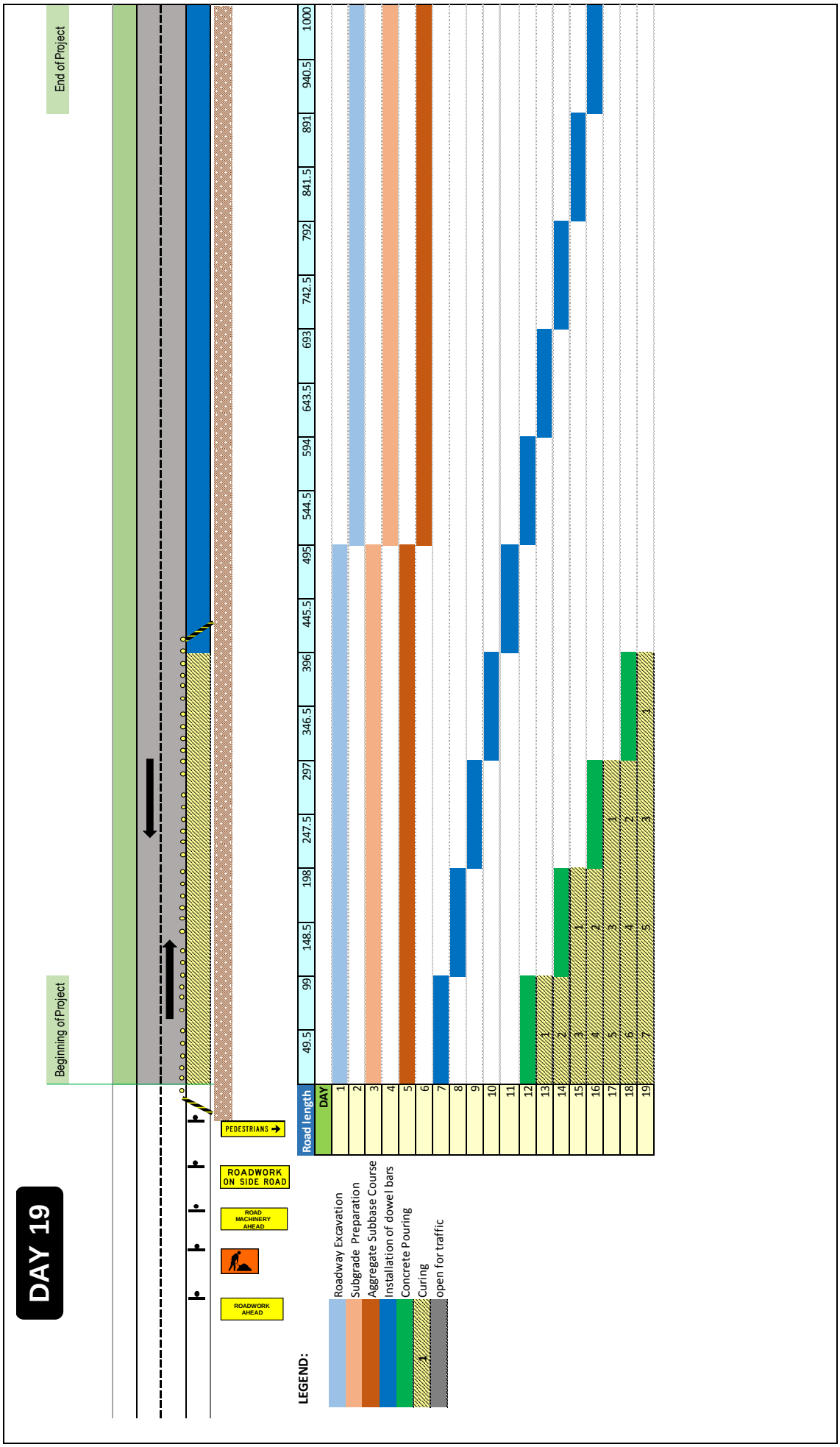

DAY 13
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic
DAY 14
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic

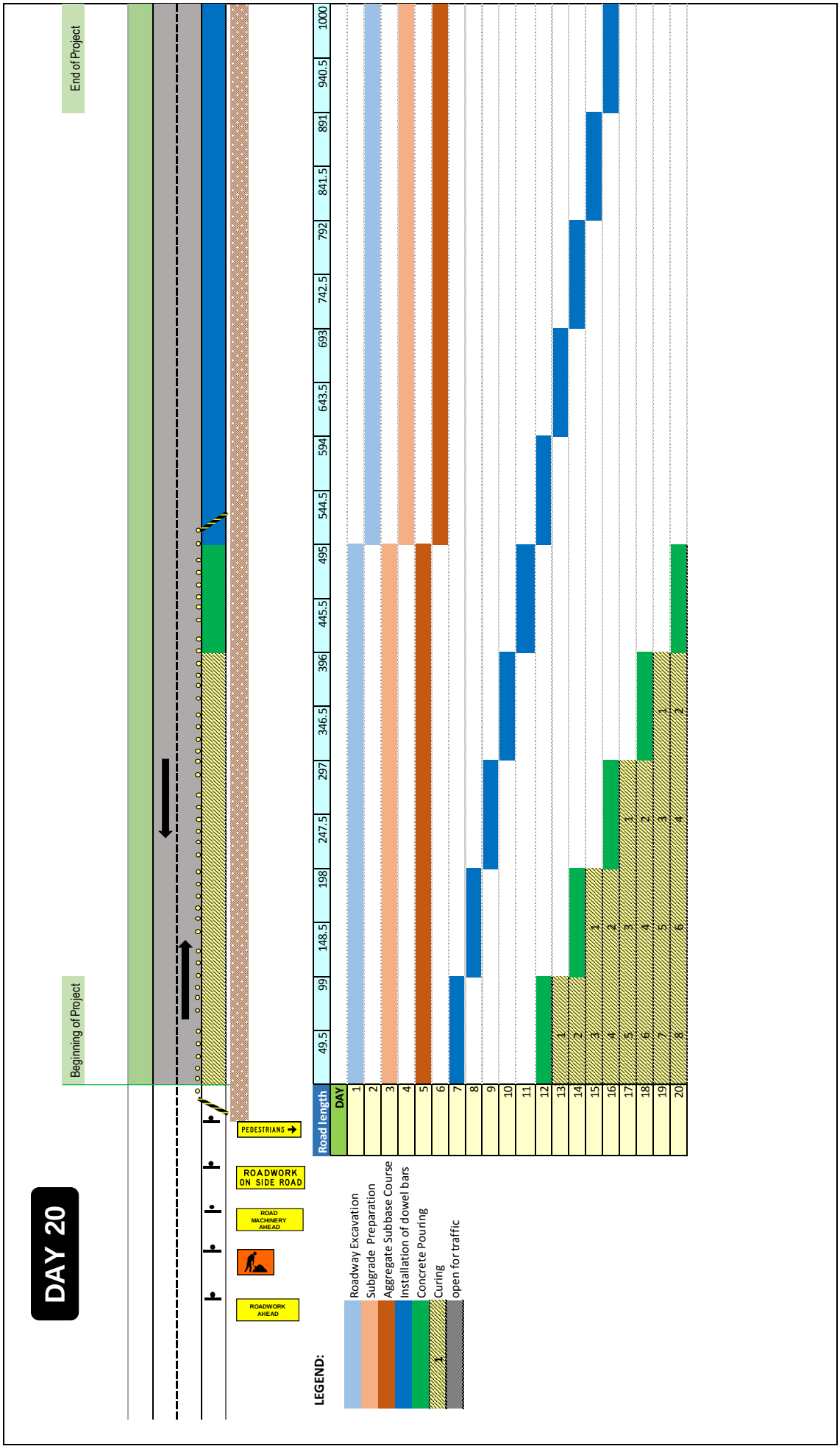

DAY 15
End of Project
Beginning of Project
PEDESTRIANS
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1
2
3
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic


DAY 16
End of Project
Beginning of Project
PEDESTRIANS
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic

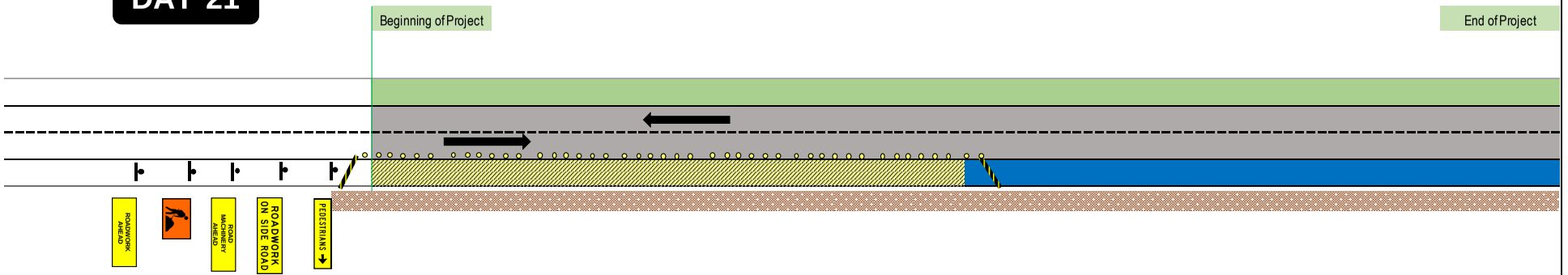

DAY 17
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000


DAY 18
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic


DAY 19
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic


DAY 20
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000

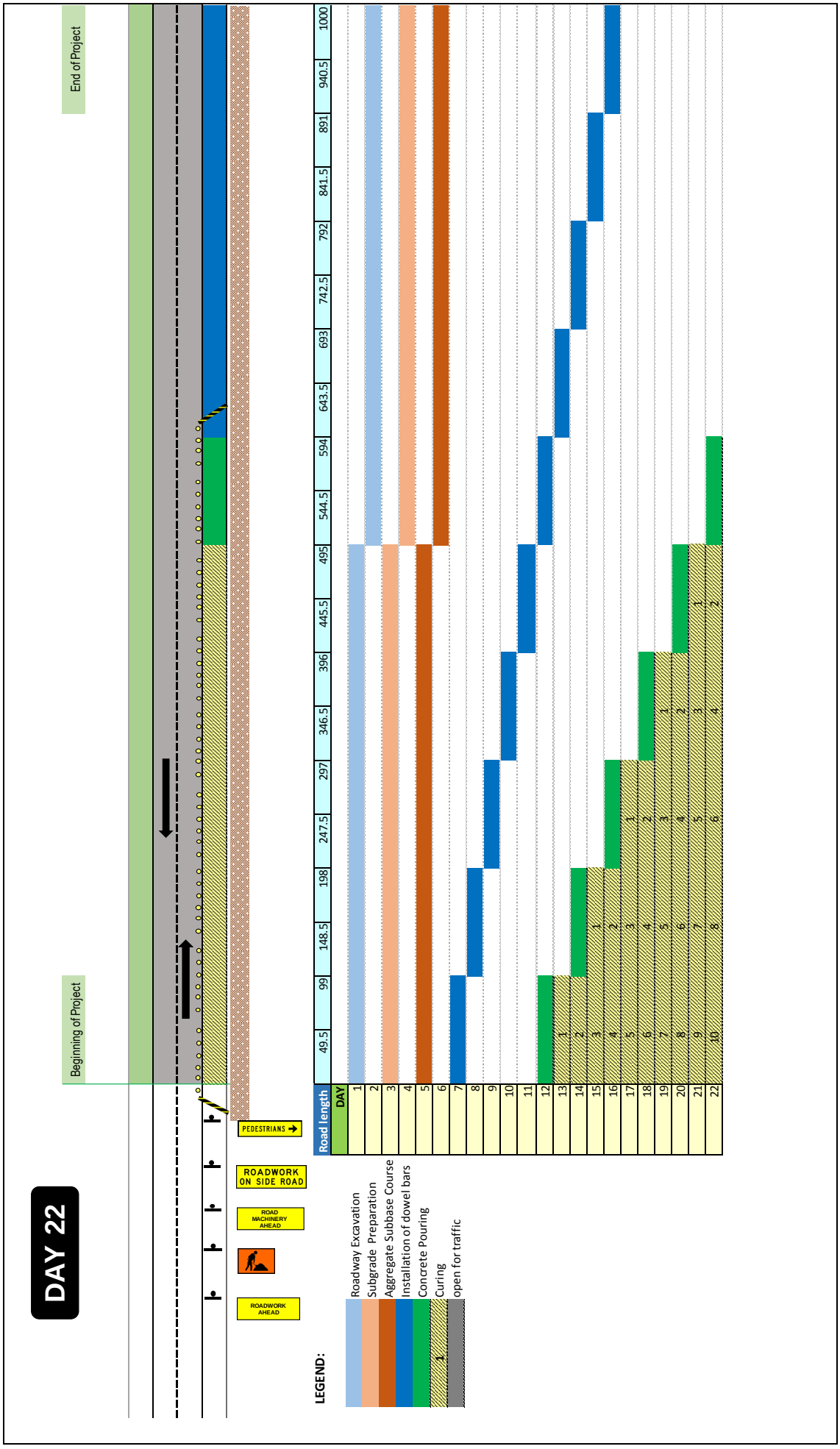
DAY 21



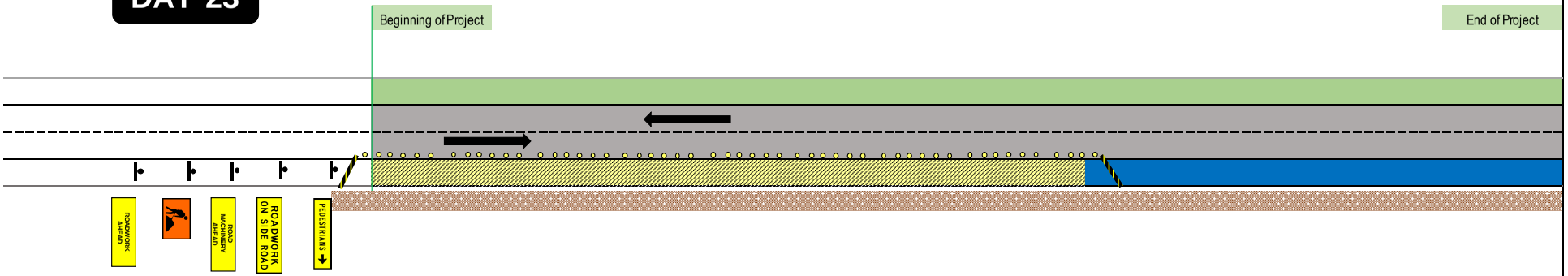
LEGEND:

- Roadway Excavation
- Subgrade Preparation
- Aggregate Subbase Course
- Installation of dowel bars
- Concrete Pouring
- 1 Curing
- open for traffic

Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13	1																			
14	2																			
15	3		1																	
16	4		2																	
17	5		3		1															
18	6		4		2															
19	7		5		3		1													
20	8		6		4		2													
21	9		7		5		3		1											


DAY 22
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000

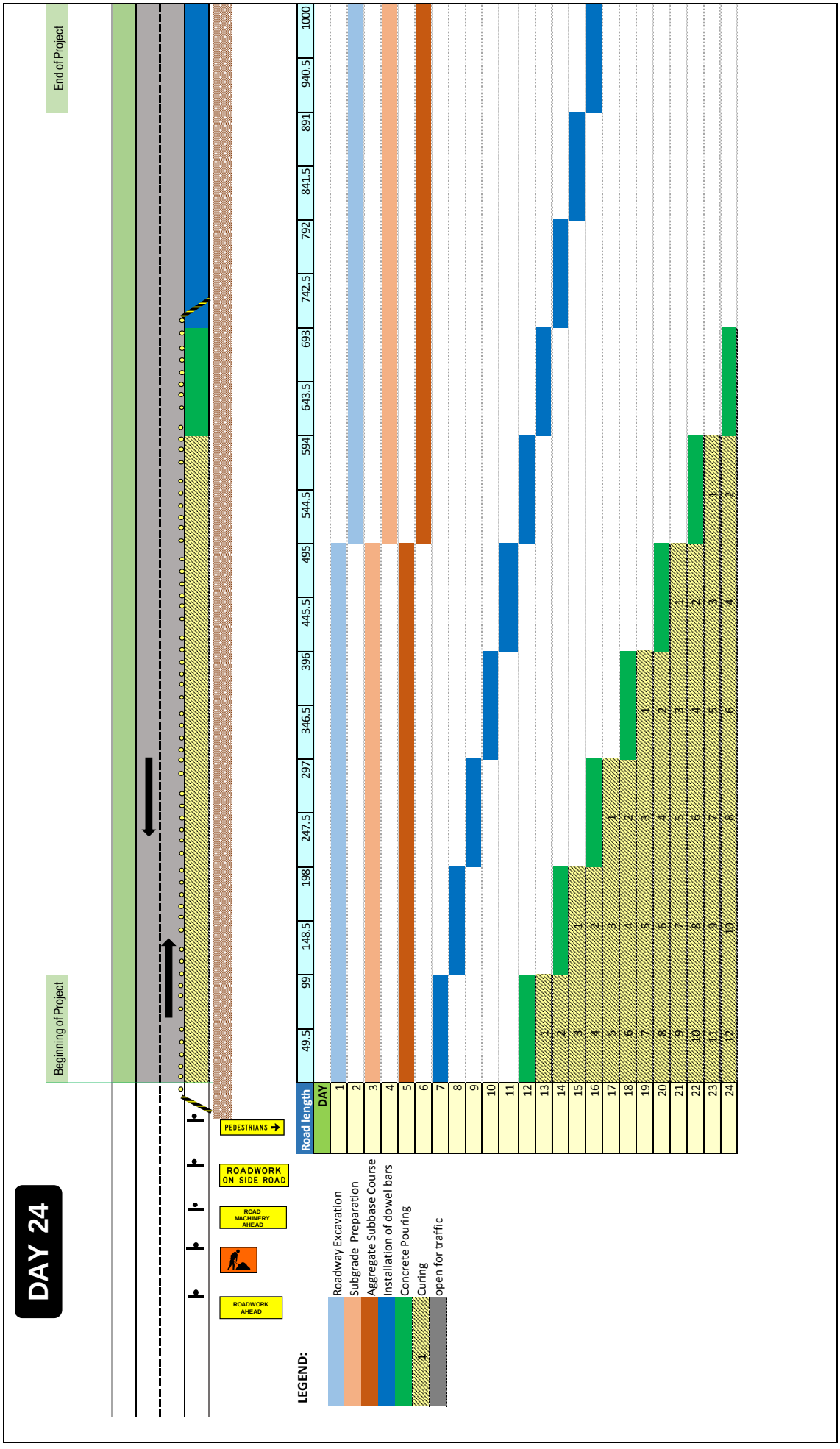
DAY 23

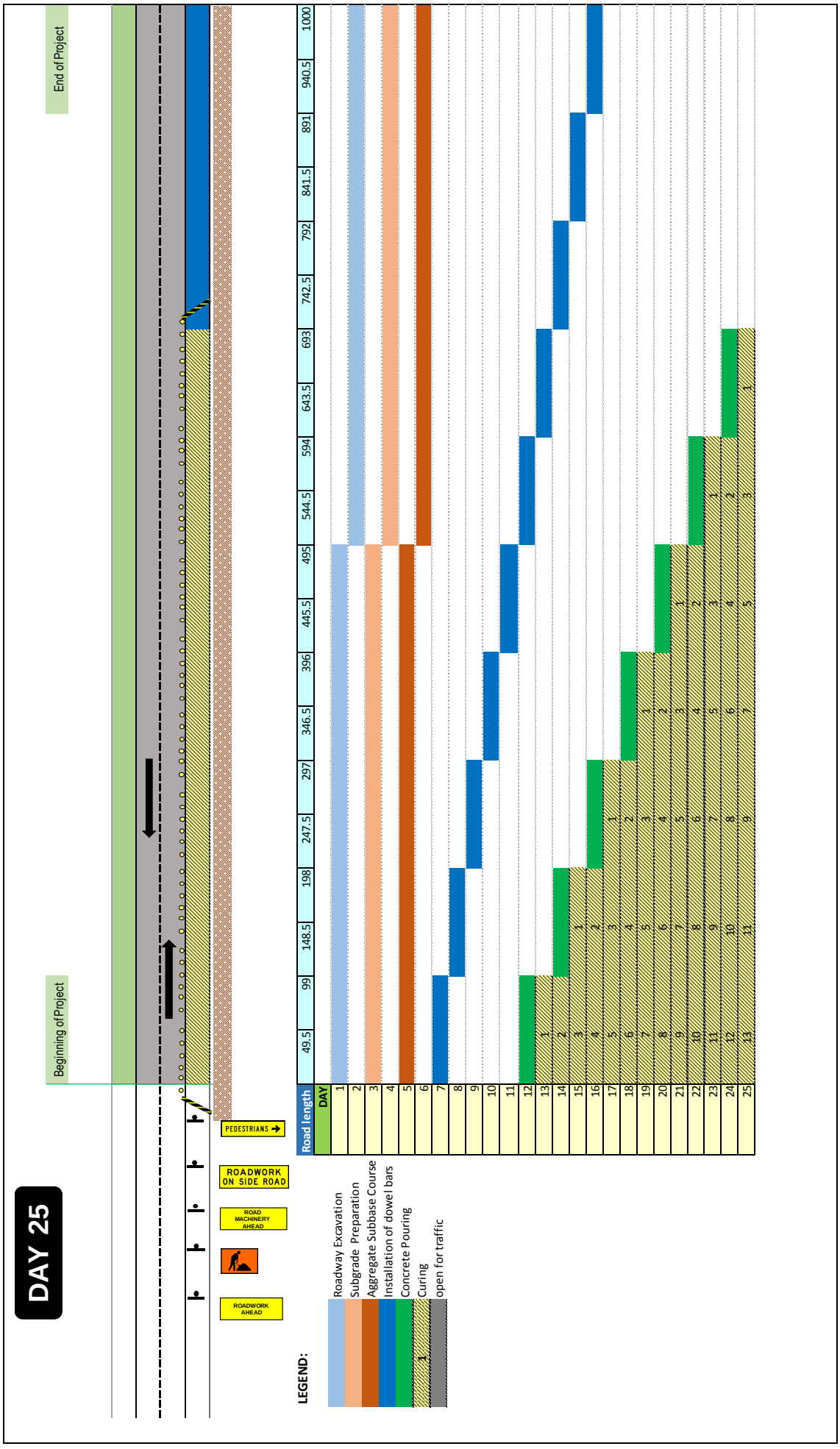


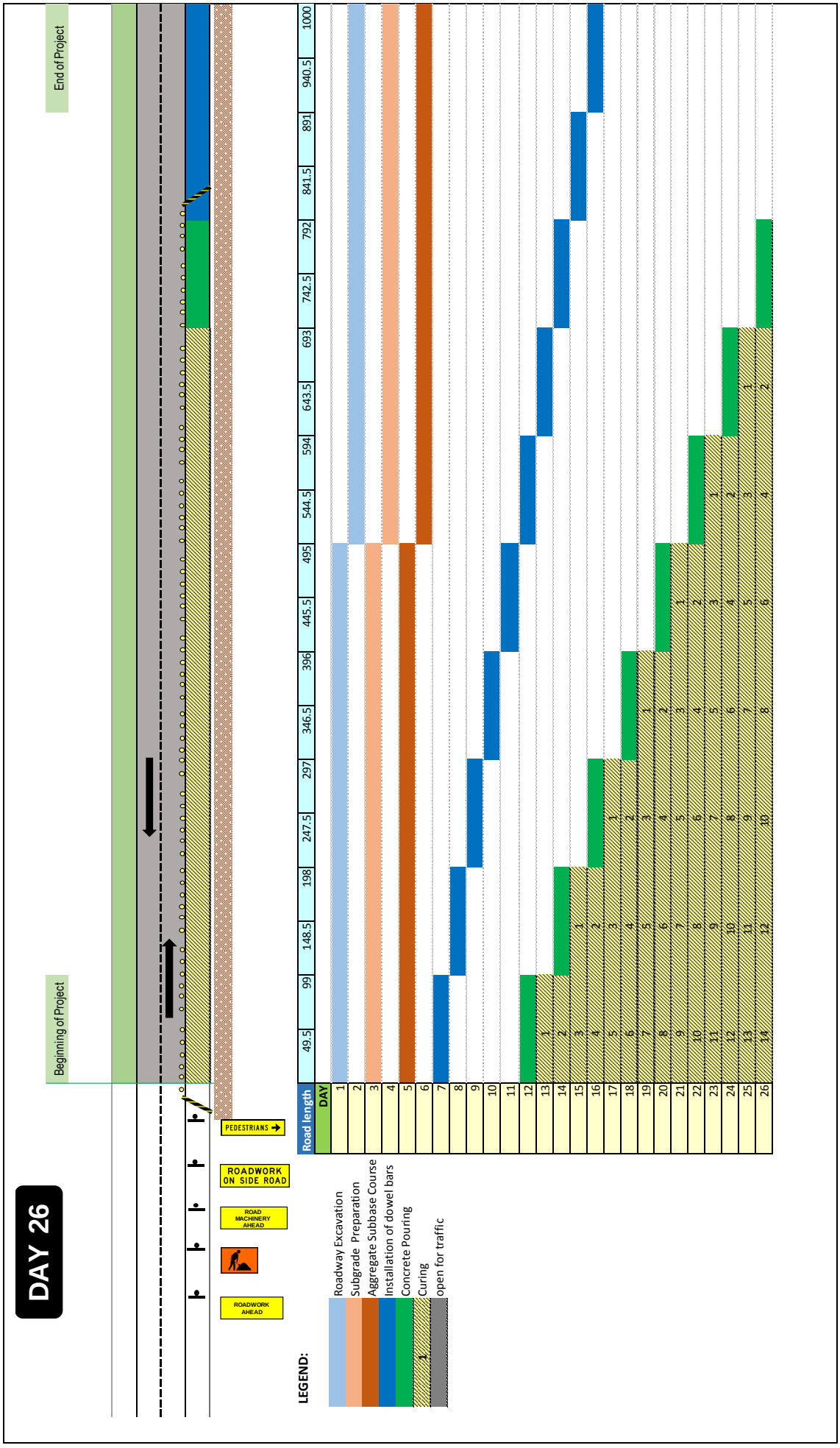
LEGEND:

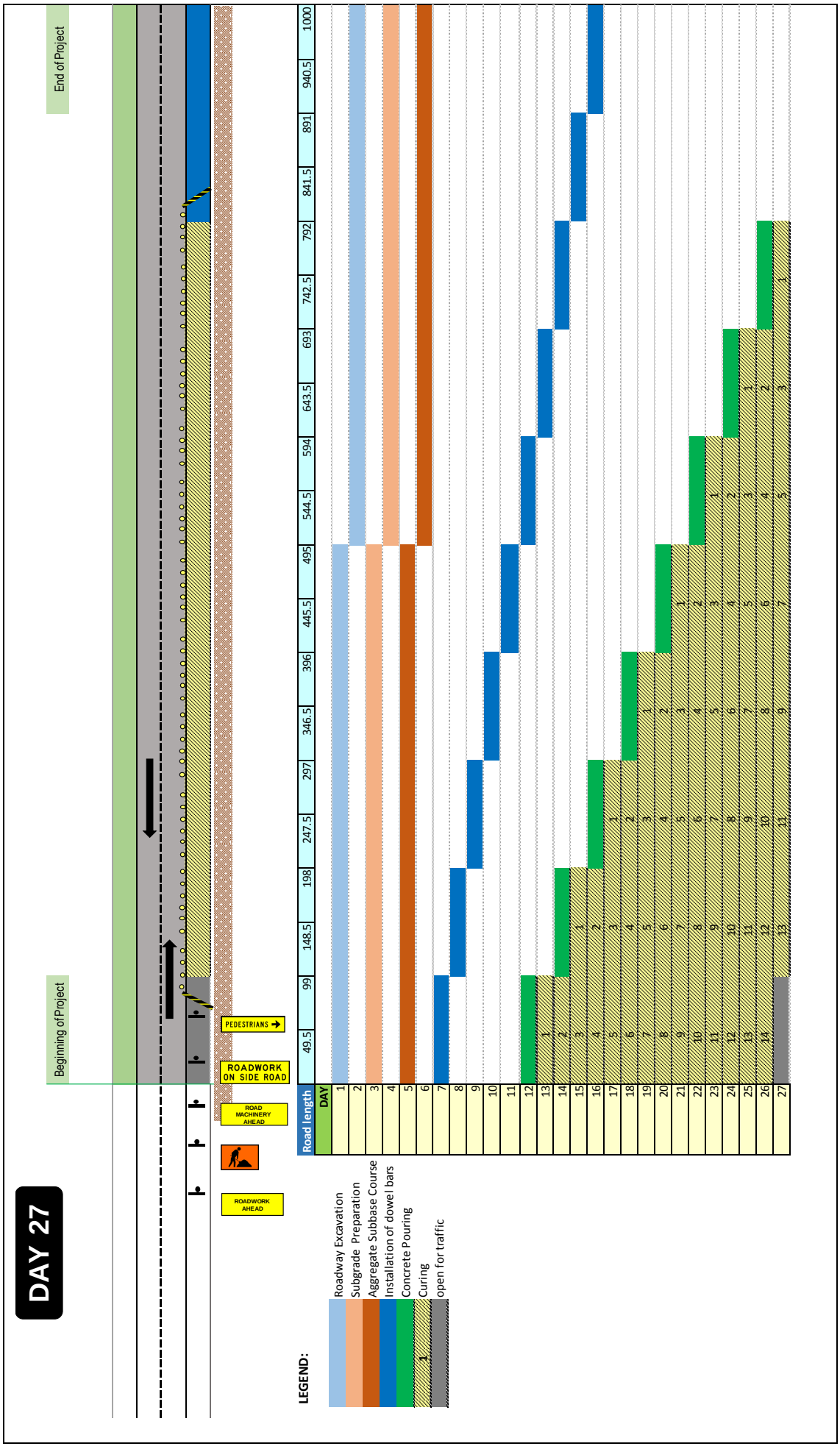
- Roadway Excavation
- Subgrade Preparation
- Aggregate Subbase Course
- Installation of dowel bars
- Concrete Pouring
- 1 Curing
- open for traffic

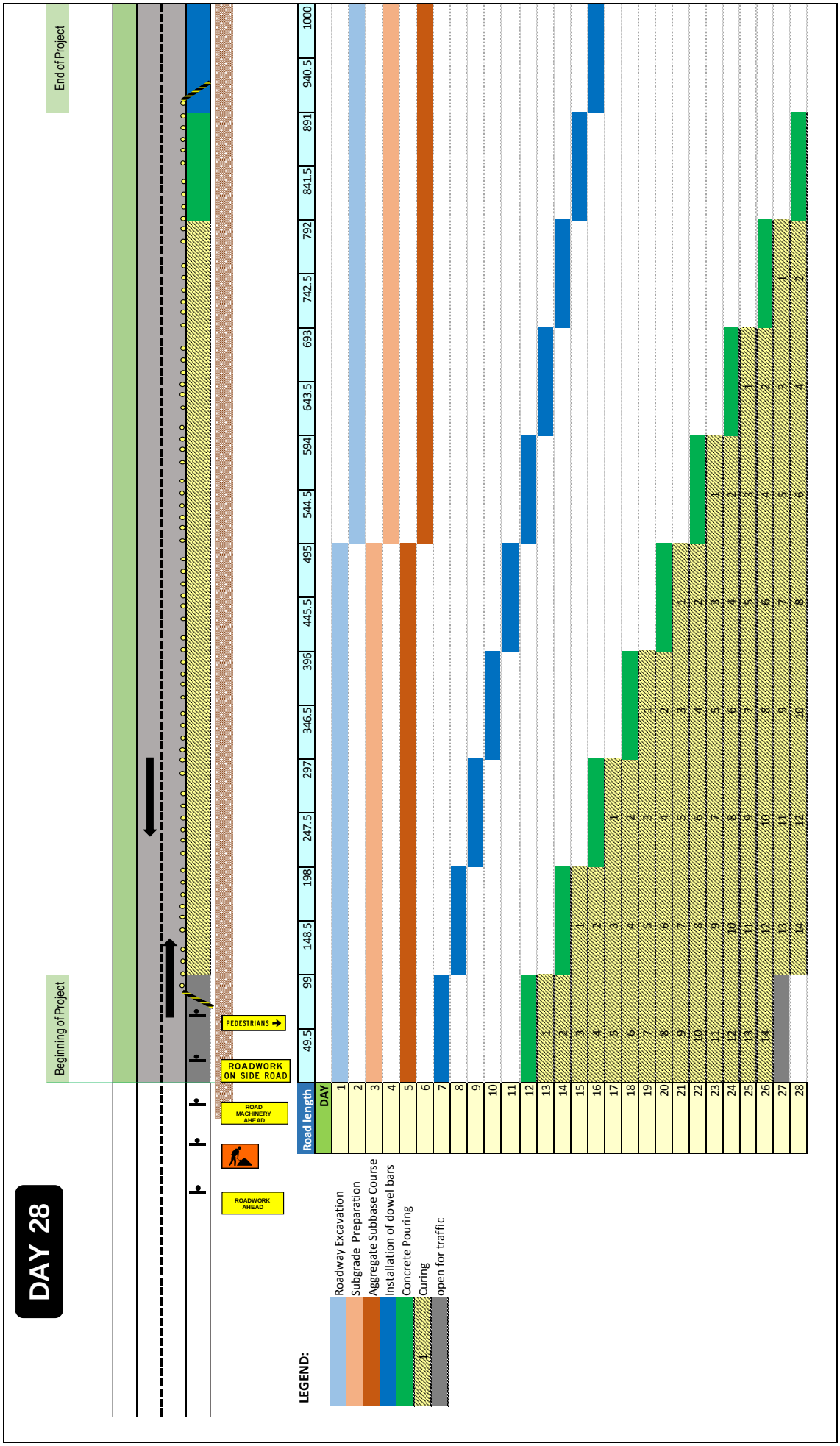
Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13	1																			
14	2																			
15	3		1																	
16	4		2																	
17	5		3		1															
18	6		4		2															
19	7		5		3		1													
20	8		6		4		2													
21	9		7		5		3		1											
22	10		8		6		4		2											
23	11		9		7		5		3		1									

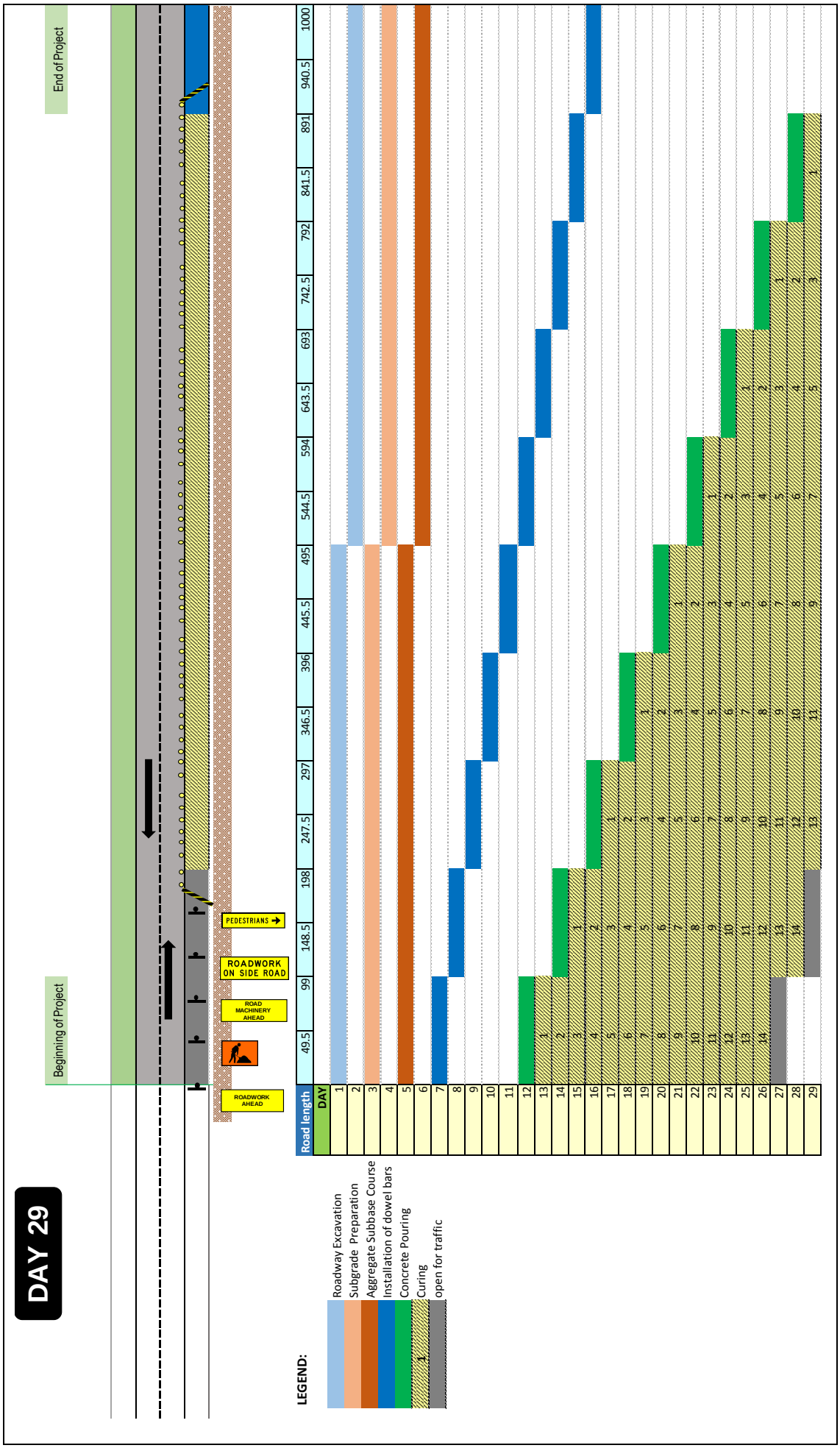

DAY 24
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000

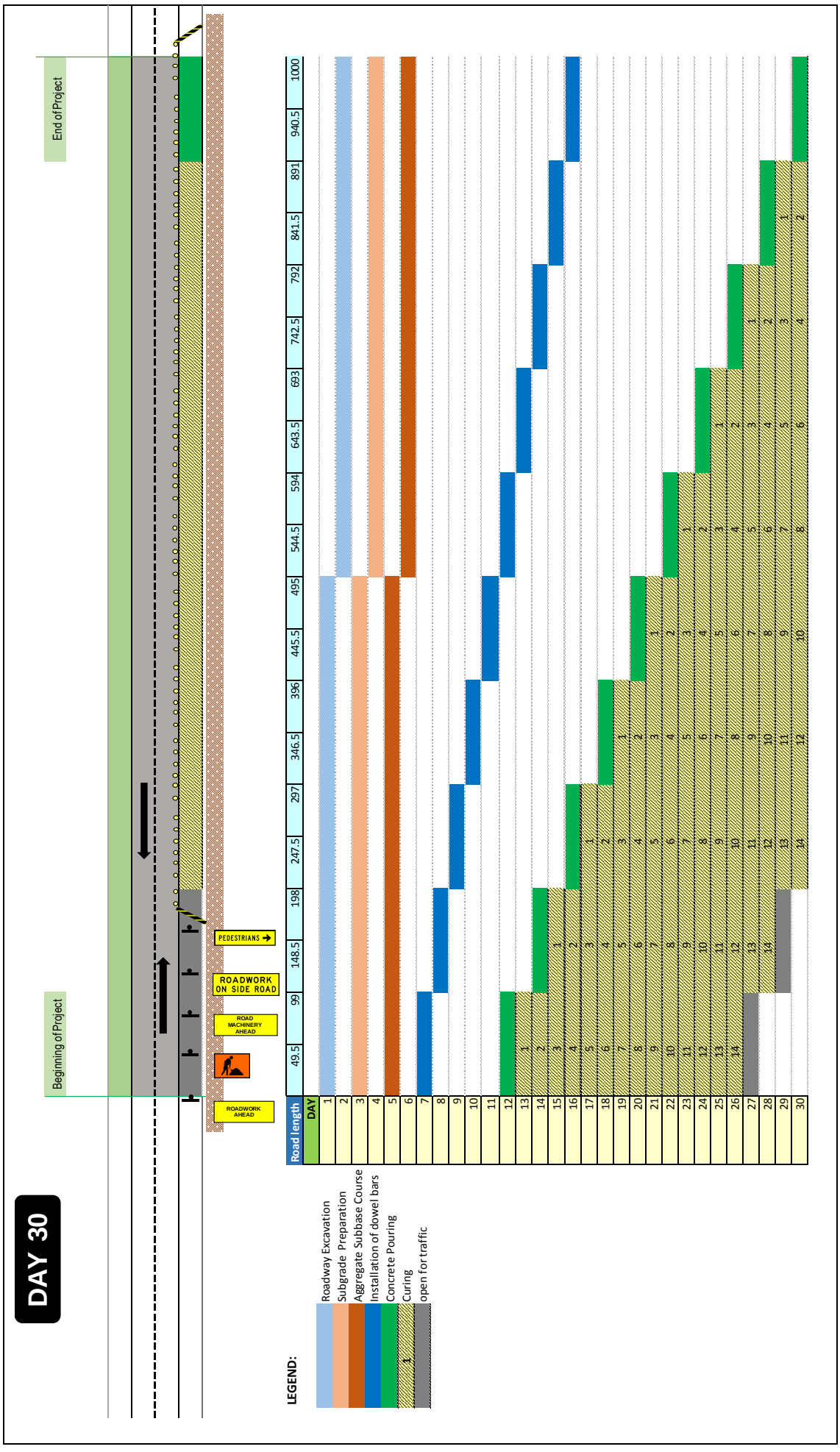

DAY 25
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000


DAY 26
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000

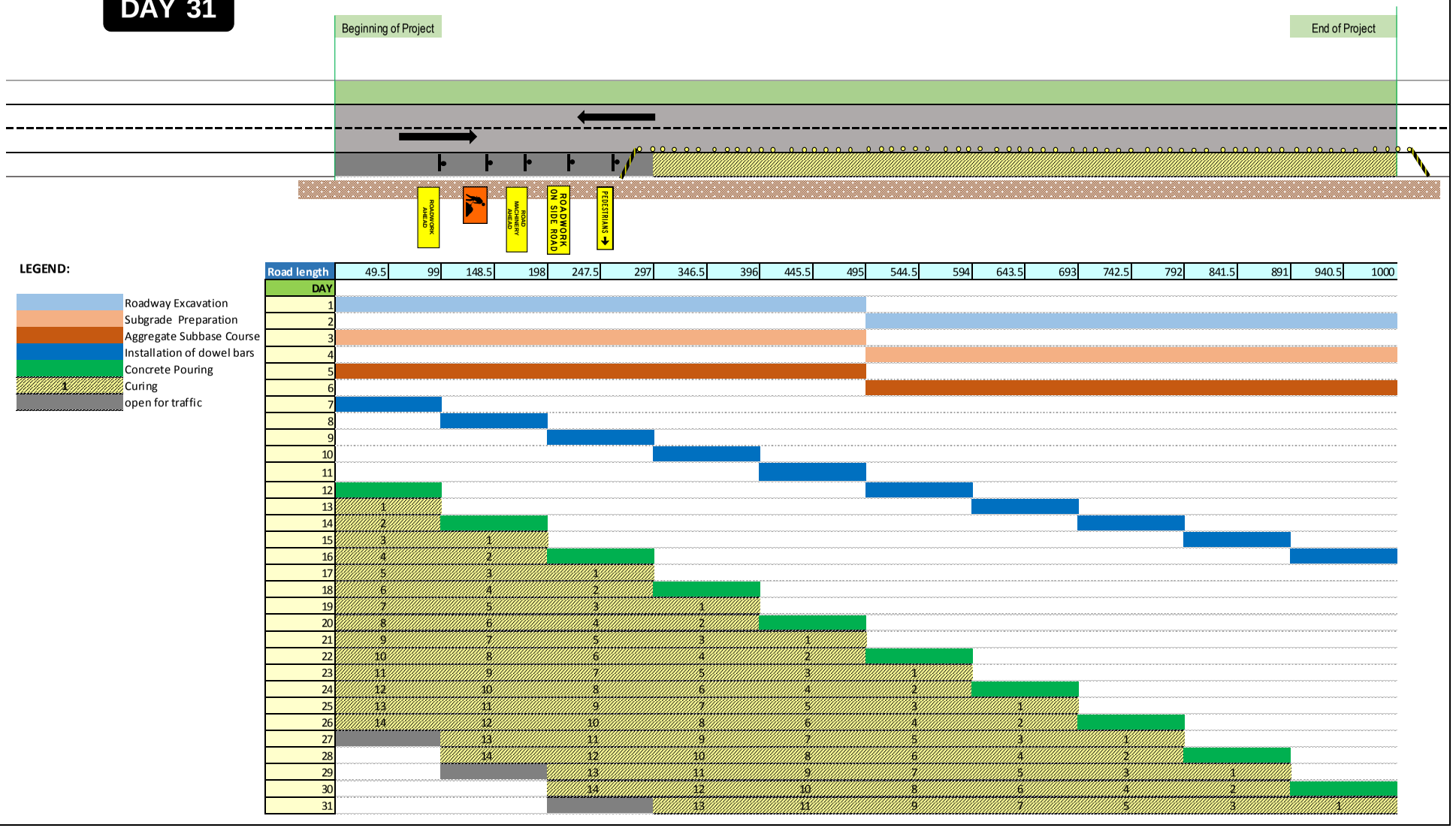

DAY 27
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic


DAY 28
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic


DAY 29
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic


DAY 30
End of Project
Beginning of Project
PEDESTRIANS
ROADWORK ON SIDE ROAD
ROAD MACHINERY AHEAD
ROADWORK AHEAD
Road length
DAY
49.5
99
148.5
198
247.5
297
346.5
396
445.5
495
544.5
594
643.5
693
742.5
792
841.5
891
940.5
1000
LEGEND:
Roadway Excavation
Subgrade Preparation
Aggregate Subbase Course
Installation of dowel bars
Concrete Pouring
Curing
open for traffic

DAY 31



Road length	49.5	99	148.5	198	247.5	297	346.5	396	445.5	495	544.5	594	643.5	693	742.5	792	841.5	891	940.5	1000
DAY																				
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13	1																			
14	2																			
15	3		1																	
16	4		2																	
17	5		3		1															
18	6		4		2															
19	7		5		3		1													
20	8		6		4		2													
21	9		7		5		3		1											
22	10		8		6		4		2											
23	11		9		7		5		3		1									
24	12		10		8		6		4		2									
25	13		11		9		7		5		3		1							
26	14		12		10		8		6		4		2							
27			13		11		9		7		5		3		1					
28			14		12		10		8		6		4		2					
29					13		11		9		7		5		3		1			
30					14		12		10		8		6		4		2			
31							13		11		9		7		5		3		1	

Same sequence of work and set-up of traffic management layout applies to the other lane of the road until the newly constructed PCCP is fully cured and may be opened for traffic. During actual construction, necessary adjustments may be made in the illustration as presented herein. Considerations should be given in the available space, existing structures, traffic and other factors to allow safe mobility of workers, equipment, pedestrians, and other road users during construction operation to install the appropriate signage, barriers, and the necessary traffic devices.

Detailed Unit Price Analysis

Road Widening of 1.00 km National Road (280 mm thk Concrete Pavement) from 2 lanes to 4 lanes
(Low Speed)

ITEM NO/DESCRIPTION : **B.8 Roadworks Safety & Traffic Management**
UNIT OF MEASUREMENT : lot
QUANTITY : 1 lot (for 87 C.D total duration for the completion of work on two lanes excluding mob./demob)

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Roadwork Ahead (T1-1)	each-day	1.00	10.95	10.95
Workmen Ahead (T1-5)	each-day	1.00	5.64	5.64
Road Machinery (T1-3)	each-day	1.00	6.54	6.54
Roadwork on Side Road (T1-25)	each-day	1.00	10.95	10.95
Pedestrians (T8-2)	each-day	1.00	4.80	4.80
Temporary Bollards (@ 5 meters apart)	each-day	50.00	=1200/(365*2)	
			1.64	82.19
(estimated quantity for bollards is for two (2) set-ups of 100 meter)				
*Barrier Boards				
SUB - TOTAL (A)				**121.07**

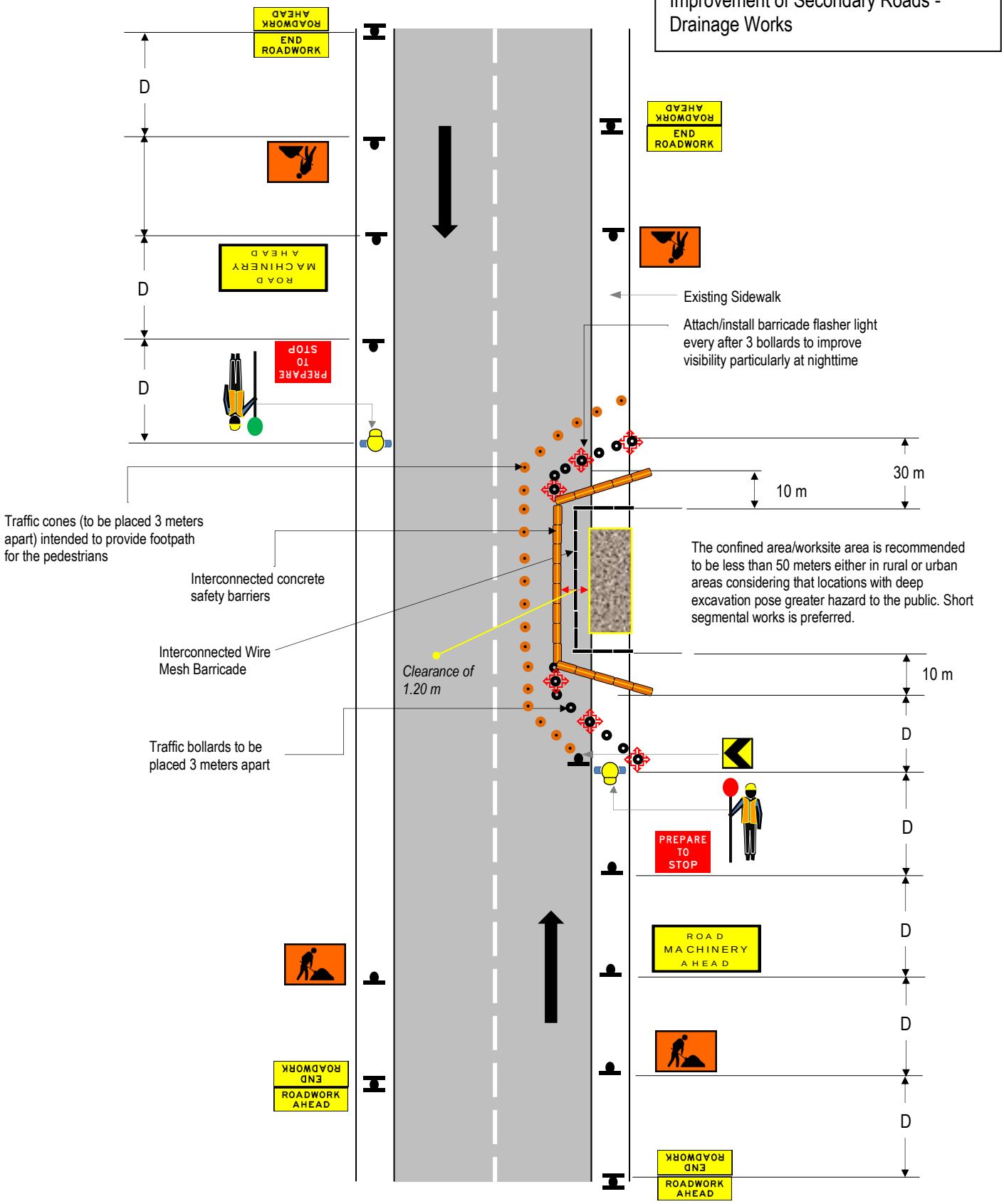
B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Hours	Rate	Cost
SUB - TOTAL (B)				**-**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
Barricade Flasher Light (3 Volts, Battery Operated, Amber Color)	16.00	12.00	0.65	125.07
SUB - TOTAL (C)				**125.07**

D. TOTAL DIRECT COST (A + B + C)			246.15
E. DIRECT UNIT COST (D/Quantity)			
F. ADD: INDIRECT COST			
1. OCM (9% of D)			
2. Contractor's Profit (8% of D)		19.69	
3. VAT 12%		31.90	
** TOTAL INDIRECT COST			51.59
** *Mark-up percentage varies depending on the total Direct Cost of the project per D.O. 22, Series 2015*	TOTAL COST (D + F)		297.73
	TOTAL RENTAL UNIT COST (PER DAY)		297.73
	Total cost for the whole duration of the project =		25,902.35

SAMPLE ILLUSTRATION NO. 3

Improvement of Secondary Roads - Drainage Works



Same set-up of traffic management layout applies as the work progresses up to the other side of the road until the newly constructed structure may be opened for traffic.

During actual construction, necessary adjustments may be made in the illustration as presented herein. Considerations should be given in the available space, existing structures, traffic and other factors to allow safe mobility of workers, equipment, pedestrians, and other road users during construction operation to provide the appropriate signage, barriers, and the necessary traffic devices.

Part - C

Cost of Construction Safety and Health Requirements

C – 1

General Steps in Deriving the Cost of Construction Safety Health

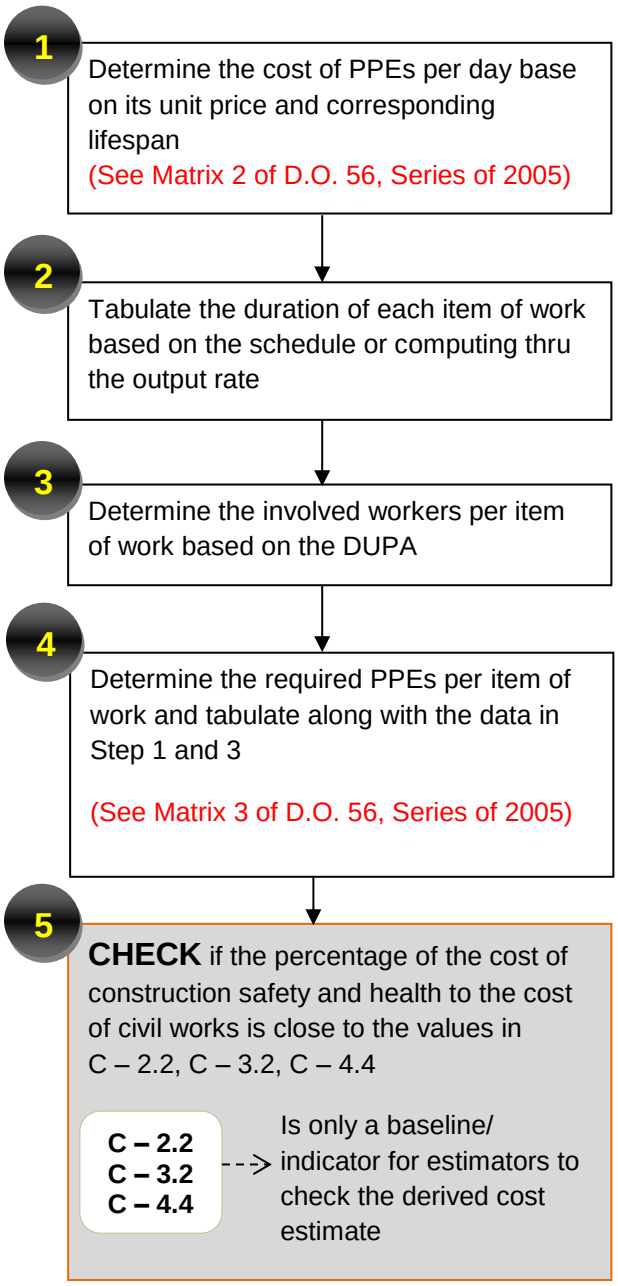


Figure 6. Steps in deriving the cost of Construction Safety and Health

C – 2 Cost of Construction Safety and Health for Roads

C – 2.1 Checklist of Personal Protective Equipment per Type of Road Project

(Note: Checklist of PPEs as reflected herein are the minimum requirements only. Should the Implementing Offices identify the need for inclusion of specialized PPEs, necessary adjustment shall be made accordingly.)

1. Paved (Concrete) to Paved (Concrete), Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
101(2) Removal of Structure (PCCP, t=0.23m.)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
105 Sub-Grade Preparation	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200(1) Levelling Course (Subbase Course)	Foreman	✓	✓	✓	✓							
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
201 Aggregate Base Course (Shoulder)	Foreman	✓	✓	✓	✓							
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓							
311 PCCP (0.23m. Thk)	Foreman	✓		✓	✓	✓					✓	
	Skilled Laborer	✓		✓	✓	✓					✓	
	Unskilled Laborer	✓		✓	✓	✓					✓	

2. Paved (Asphalt) to Paved (Concrete), Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
101(1) Removal of Structure (Asphalt Pavement)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
105 Sub-Grade Preparation	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200(1) Levelling Course (Subbase Course)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
201 Aggregate Base Course (Shoulder)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
311 PCCP (0.23m. Thk)	Foreman	✓		✓	✓	✓					✓	
	Skilled Laborer	✓		✓	✓	✓					✓	
	Unskilled Laborer	✓		✓	✓	✓					✓	

3. Paved (Asphalt) to Paved (Asphalt), Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
101(1) Removal of Structure (Asphalt Pavement)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
105 Sub-Grade Preparation	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200(1) Levelling Course (Subbase Course)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
201 Aggregate Base Course (Shoulder)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
301 Bituminous Prime Coat (RC Cut-Back Asphalt)	Foreman	✓		✓		✓					✓	
	Skilled Laborer											
	Unskilled Laborer	✓		✓		✓					✓	
302 Bituminous Tack Coat (Emulsified Asphalt)	Foreman	✓		✓		✓					✓	
	Skilled Laborer											
	Unskilled Laborer	✓		✓		✓					✓	
310(1) Bituminous Concrete Surface Course, Hot Laid (Wearing)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer	✓	✓	✓	✓	✓						
	Unskilled Laborer	✓	✓	✓	✓	✓						
310(2) Bituminous Concrete Surface Course, Hot Laid (Binder)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer	✓	✓	✓	✓	✓						
	Unskilled Laborer	✓	✓	✓	✓	✓						

4. Gravel to Asphalt, Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
105 Sub-Grade Preparation	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200 Aggregate Subbase Course	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
201 Aggregate Base Course	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
301 Bituminous Prime Coat (RC Cut-Back Asphalt)	Foreman	✓		✓							✓	
	Skilled Laborer											
	Unskilled Laborer	✓		✓							✓	
302 Bituminous Tack Coat (Emulsified Asphalt)	Foreman	✓		✓							✓	
	Skilled Laborer											
	Unskilled Laborer	✓		✓							✓	
310(1) Bituminous Concrete Surface Course, Hot Laid (Wearing)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer	✓	✓	✓	✓	✓						
	Unskilled Laborer	✓	✓	✓	✓	✓						
310(2) Bituminous Concrete Surface Course, Hot Laid (Binder)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer	✓	✓	✓	✓	✓						
	Unskilled Laborer	✓	✓	✓	✓	✓						

5. Gravel to Concrete, Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
105	Foreman	✓	✓	✓	✓	✓						
Sub-Grade Preparation	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200	Foreman	✓	✓	✓	✓	✓						
Aggregate Subbase Course	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
201	Foreman	✓	✓	✓	✓	✓						
Aggregate Base Course (Shoulder)	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
311	Foreman	✓		✓							✓	
PCCP (0.23m. Thk)	Skilled Laborer	✓		✓							✓	
	Unskilled Laborer	✓		✓							✓	

6. Asphalt Overlay, Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
SPL	Foreman	✓	✓	✓	✓	✓						
Surface Project (Sealing /Patching)	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
302	Foreman	✓		✓	✓	✓					✓	
Bituminous Tack Coat (Emulsified Asphalt)	Skilled Laborer											
	Unskilled Laborer	✓		✓	✓	✓					✓	
310(1)	Foreman	✓	✓	✓	✓	✓						
Bituminous Concrete Surface Course, Hot Laid	Skilled Laborer	✓	✓	✓	✓	✓						
	Unskilled Laborer	✓	✓	✓	✓	✓						

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
101(1)	Foreman	✓	✓	✓	✓	✓						
Removal of Deteriorated Subbase	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
101(2)	Foreman	✓	✓	✓	✓	✓						
Removal of Structure (PCCP, t=0.23m.)	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200	Foreman	✓	✓	✓	✓	✓						
Aggregate Subbase Course	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
302	Foreman	✓		✓	✓	✓					✓	
Bituminous Tack Coat (Emulsified Asphalt)	Skilled Laborer											
	Unskilled Laborer	✓		✓	✓	✓					✓	
310	Foreman	✓	✓	✓	✓	✓						
Bituminous Concrete Surface Course, Hot Laid	Skilled Laborer	✓	✓	✓	✓	✓						
	Unskilled Laborer	✓	✓	✓	✓	✓						
311	Foreman	✓		✓	✓	✓					✓	
PCCP (0.23m. Thk)	Skilled Laborer	✓		✓	✓	✓					✓	
	Unskilled Laborer	✓		✓	✓	✓					✓	

8. Concrete Reblocking (50% of Existing PCCP), Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
101(1)	Foreman	✓	✓	✓	✓	✓						
Removal of Deteriorated Subbase	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
101(2)	Foreman	✓	✓	✓	✓	✓						
Removal of Structure (PCCP, t=0.23m.)	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200	Foreman	✓	✓	✓	✓	✓						
Aggregate Subbase Course	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
302	Foreman	✓		✓	✓	✓					✓	
Bituminous Tack Coat (Emulsified Asphalt)	Skilled Laborer											
	Unskilled Laborer	✓		✓	✓	✓					✓	
310	Foreman	✓	✓	✓	✓	✓						
Bituminous Concrete Surface Course, Hot Laid	Skilled Laborer	✓	✓	✓	✓	✓						
	Unskilled Laborer	✓	✓	✓	✓	✓						
311	Foreman	✓		✓	✓	✓					✓	
PCCP (0.23m. Thk)	Skilled Laborer	✓		✓	✓	✓					✓	
	Unskilled Laborer	✓		✓	✓	✓					✓	

9. Re-Gravelling, Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
105	Foreman	✓	✓	✓	✓	✓						
Sub-Grade Preparation	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200	Foreman	✓	✓	✓	✓	✓						
Aggregate Subbase Course	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						

10. New Road Opening, Concrete, Assume Embankment H=1.00m., Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAVETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
100	Foreman	✓	✓	✓	✓	✓						
Clearing and Grubbing	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
104	Foreman	✓	✓	✓	✓	✓						
Embankment	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
105	Foreman	✓	✓	✓	✓	✓						
Sub-Grade Preparation	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200	Foreman	✓	✓	✓	✓	✓						
Aggregate Subbase Course	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
311	Foreman	✓		✓	✓	✓					✓	
PCCP (0.23m. Thk)	Skilled Laborer	✓		✓	✓	✓					✓	
	Unskilled Laborer	✓		✓	✓	✓					✓	
103(3)	Foreman					✓						
Foundation Fill	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
500	Foreman	✓	✓	✓	✓	✓						
Reinforced Concrete Pipe Culvert (910mm dia.)	Skilled Laborer	✓		✓	✓	✓					✓	
	Unskilled Laborer	✓		✓	✓	✓					✓	

11. New Road Opening, Concrete, Assume Road Cut H=1.00m., Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
100 Clearing and Grubbing	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
102 Roadway Excavation	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
105 Sub-Grade Preparation	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200 Aggregate Subbase Course	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
311 PCCP (0.23m. Thk)	Foreman	✓		✓	✓	✓					✓	
	Skilled Laborer	✓		✓	✓	✓					✓	
	Unskilled Laborer	✓		✓	✓	✓					✓	
103(3) Foundation Fill	Foreman		✓			✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
500 Reinforced Concrete Pipe Culvert (910mm dia.)	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer	✓		✓	✓	✓					✓	
	Unskilled Laborer	✓		✓	✓	✓					✓	

12. Widening Paved, PCCP, Assume 1Km. Length

ITEM NO./ DESCRIPTION	WORKERS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
100 Clearing and Grubbing	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
102 Roadway Excavation	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
105 Sub-Grade Preparation	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
200 Aggregate Subbase Course	Foreman	✓	✓	✓	✓	✓						
	Skilled Laborer											
	Unskilled Laborer	✓	✓	✓	✓	✓						
311 PCCP (0.23m. Thk)	Foreman	✓		✓	✓	✓					✓	
	Skilled Laborer	✓		✓	✓	✓					✓	
	Unskilled Laborer	✓		✓	✓	✓					✓	

Cost Computation (Roads)

C – 2.2

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (ROAD -1)

1. Paved (Concrete) to Paved (Concrete), Assume 1Km. Length , with 54.50 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
101(2) Removal of Structure (PCCP, t=0.23m.)	6,700.00	40	Foreman	1	20.94	20.94	20.94	20.94	20.94	20.94	6.282	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	20.94	41.88	41.88	41.88	41.88	41.88	12.564	0	0	0	0	0	0	
105 Sub-Grade Preparation	10,700.00	300	Foreman	1	4.46	4.46	4.46	4.46	4.46	4.46	1.338	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	4.46	8.92	8.92	8.92	8.92	8.92	2.676	0	0	0	0	0	0	
200(1) Levelling Course (Subbase Course)	670.00	50	Foreman	1	1.68	1.68	1.68	1.68	1.68	1.68	0.504	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	1.68	3.36	3.36	3.36	3.36	3.36	1.008	0	0	0	0	0	0	
201 Aggregate Base Course (Shoulder)	400.00	50	Foreman	1	1.00	1	1	1	1	1	0.3	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	1.00	2	2	2	2	2	0.6	0	0	0	0	0	0	
311 PCCP (0.23m. Thk)	6,700.00	70	Foreman	1	11.96	11.96	11.96	0	11.96	11.96	3.588	0	0	0	0	11.96	0	
			Skilled Laborer	4	11.96	47.84	47.84	0	47.84	47.84	14.352	0	0	0	0	47.84	0	
			Unskilled Laborer	12	11.96	143.52	143.52	0	143.52	143.52	43.056	0	0	0	0	143.52	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**29**		**287.56**	**288**	**84**	**288**	**288**	**86**	-	-	-	-	**203**	-	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C÷B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	-	-	-	-	**1.39**	-	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**71.12**	**233.56**	**639.02**	**2,204.63**	**28.95**	-	-	-	-	**281.86**	-	**3,459.15**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**2,000.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**15,260.00**
			H. TOTAL DIRECT COST (E + F + G)															**20,719.15**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**1,657.53**
			K. VAT (12% of E + H + I)															**2,685.20**
			L. TOTAL COST (E + H + I + J)															**25,061.88**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
Paved (Concrete) to Paved (Concrete), 1 km length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	288	0.25	71.12
Safety Shoes	man-day	84	2.77	233.56
Safety Vest	man-day	288	2.22	639.02
Working Gloves	man-day	288	7.67	2,204.63
Rubber Boots	man-day	203	1.39	281.86
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	86	0.34	28.95
SUB - TOTAL (A)				**3,459.15**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	4.00	500.00	2,000.00
Health Personnel (Full Time)	1.00	54.50	280.00	15,260.00
SUB - TOTAL (B)				**17,260.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		20,719.15
E.	DIRECT UNIT COST (D/Quantity)		20,719.15
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	1,657.53	
	3. VAT 12%	2,685.20	
	TOTAL INDIRECT COST		4,342.73
	TOTAL COST (D + F)		25,061.88

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

2. Paved (Asphalt) to Paved (Concrete), Assume 1Km. Length, with 52 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
101(1) Removal of Structure (Asphalt Pavement)	6,700.00	60	Foreman	1	13.96	13.96	13.96	13.96	13.96	13.96	4.188	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	13.96	27.92	27.92	27.92	27.92	27.92	8.376	0	0	0	0	0	0	
105 Sub-Grade Preparation	10,700.00	300	Foreman	1	4.46	4.46	4.46	4.46	4.46	4.46	1.338	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	4.46	8.92	8.92	8.92	8.92	8.92	2.676	0	0	0	0	0	0	
200(1) Levelling Course (Subbase Course)	1,938.00	50	Foreman	1	4.85	4.85	4.85	4.85	4.85	4.85	1.455	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	4.85	9.7	9.7	9.7	9.7	9.7	2.91	0	0	0	0	0	0	
201 Aggregate Base Course (Shoulder)	920.00	50	Foreman	1	2.30	2.3	2.3	2.3	2.3	2.3	0.69	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	2.30	4.6	4.6	4.6	4.6	4.6	1.38	0	0	0	0	0	0	
311 PCCP (0.23m. Thk)	6,700.00	70	Foreman	1	11.96	11.96	11.96	0	11.96	11.96	3.588	0	0	0	0	11.96	0	
			Skilled Laborer	4	11.96	47.84	47.84	0	47.84	47.84	14.352	0	0	0	0	47.84	0	
			Unskilled Laborer	12	11.96	143.52	143.52	0	143.52	143.52	43.056	0	0	0	0	143.52	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**29**		**280.03**	**280**	**77**	**280**	**280**	**84**	-	-	-	-	**203**	-	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	-	-	-	-	**1.39**	-	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**69.26**	**212.69**	**622.29**	**2,146.90**	**28.19**	-	-	-	-	**281.86**	-	**3,361.19**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**2,000.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**14,560.00**
			H. TOTAL DIRECT COST (E + F + G)															**19,921.19**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**1,593.70**
			K. VAT (12% of E + H + I)															**2,581.79**
			L. TOTAL COST (E + H + I + J)															**24,096.67**

Detailed Unit Price Analysis
Paved (Asphalt) to Paved (Concrete), Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	280	0.25	69.26
Safety Shoes	man-day	77	2.77	212.69
Safety Vest	man-day	280	2.22	622.29
Working Gloves	man-day	280	7.67	2,146.90
Rubber Boots	man-day	203	1.39	281.86
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	84	0.34	28.19
SUB - TOTAL (A)				**3,361.19**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	4.00	500.00	2,000.00
Health Personnel (Full Time)	1.00	52.00	280.00	14,560.00
SUB - TOTAL (B)				**16,560.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		19,921.19
E.	DIRECT UNIT COST (D/Quantity)		19,921.19
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	1,593.70	
	3. VAT 12%	2,581.79	
	TOTAL INDIRECT COST		4,175.48
	TOTAL COST (D + F)		24,096.67

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

3. Paved (Asphalt) to Paved (Asphalt), Assume 1Km. Length, with 40 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
101(1) Removal of Structure (Asphalt Pavement)	6,700.00	60	Foreman	1	13.96	13.96	13.96	13.96	13.96	13.96	4.188	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	13.96	27.92	27.92	27.92	27.92	27.92	8.376	0	0	0	0	0	0	
105 Sub-Grade Preparation	10,700.00	300	Foreman	1	4.46	4.46	4.46	4.46	4.46	4.46	1.338	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	4.46	8.92	8.92	8.92	8.92	8.92	2.676	0	0	0	0	0	0	
200(1) Levelling Course (Subbase Course)	670.00	50	Foreman	1	1.68	1.68	1.68	1.68	1.68	1.68	0.504	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	1.68	3.36	3.36	3.36	3.36	3.36	1.008	0	0	0	0	0	0	
201 Aggregate Base Course (Shoulder)	400.00	50	Foreman	1	1.00	1	1	1	1	1	0.3	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	1.00	2	2	2	2	2	0.6	0	0	0	0	0	0	
301 Bituminous Prime Coat (RC Cut-Back Asphalt)	13.40	0.3	Foreman	1	5.58	5.58	5.58	0	5.58	5.58	1.674	0	0	0	0	5.58	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	5.58	16.74	16.74	0	16.74	16.74	5.022	0	0	0	0	16.74	0	
302 Bituminous Tack Coat (Emulsified Asphalt)	4.69	0.3	Foreman	1	1.95	1.95	1.95	0	1.95	1.95	0.585	0	0	0	0	1.95	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	1.95	5.85	5.85	0	5.85	5.85	1.755	0	0	0	0	5.85	0	
310(1) Bituminous Concrete Surface Course, Hot Laid (Wearing)	6,700.00	171.3	Foreman	1	4.89	4.89	4.89	4.89	4.89	4.89	1.467	0	0	0	0	0	0	
			Skilled Laborer	4	4.89	19.56	19.56	19.56	19.56	19.56	5.868	0	0	0	0	0	0	
			Unskilled Laborer	8	4.89	39.12	39.12	39.12	39.12	39.12	11.736	0	0	0	0	0	0	
310(2) Bituminous Concrete Surface Course, Hot Laid (Binder)	6,700.00	171.3	Foreman	1	4.89	4.89	4.89	4.89	4.89	4.89	1.467	0	0	0	0	0	0	
			Skilled Laborer	4	4.89	19.56	19.56	19.56	19.56	19.56	5.868	0	0	0	0	0	0	
			Unskilled Laborer	8	4.89	39.12	39.12	39.12	39.12	39.12	11.736	0	0	0	0	0	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**46**		**220.56**	**221**	**190**	**221**	**221**	**66**	**-**	**-**	**-**	**-**	**30**	**-**	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	**-**	**-**	**-**	**-**	**1.39**	**-**	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**54.55**	**528.01**	**490.13**	**1,690.96**	**22.21**	**-**	**-**	**-**	**-**	**41.76**	**-**	**2,827.62**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**1,500.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**11,200.00**
			H. TOTAL DIRECT COST (E + F + G)															**15,527.62**
			I. OCM (9% of E)															**-**
			J. PROFIT (8% of E)															**1,242.21**
			K. VAT (12% of E + H + I)															**2,012.38**
			L. TOTAL COST (E + H + I + J)															**18,782.21**

Detailed Unit Price Analysis
Paved (Asphalt) to Paved (Asphalt), Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	221	0.25	54.55
Safety Shoes	man-day	190	2.77	528.01
Safety Vest	man-day	221	2.22	490.13
Working Gloves	man-day	221	7.67	1,690.96
Rubber Boots	man-day	30	1.39	41.76
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	66	0.34	22.21
SUB - TOTAL (A)				**2,827.62**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	3.00	500.00	1,500.00
Health Personnel (Full Time)	1.00	40.00	280.00	11,200.00
SUB - TOTAL (B)				**12,700.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		15,527.62
E.	DIRECT UNIT COST (D/Quantity)		15,527.62
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	1,242.21	
	3. VAT 12%	2,012.38	
	TOTAL INDIRECT COST		3,254.59
	TOTAL COST (D + F)		18,782.21

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (ROAD - 4)

4. Gravel to Asphalt, Assume 1Km. Length, with 31 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
105 Sub-Grade Preparation	10,700.00	300	Foreman	1	4.46	4.46	4.46	4.46	4.46	4.46	1.338	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	4.46	8.92	8.92	8.92	8.92	8.92	2.676	0	0	0	0	0	0	
200 Aggregate Subbase Course	1,264.00	50	Foreman	1	3.16	3.16	3.16	3.16	3.16	3.16	0.948	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	3.16	6.32	6.32	6.32	6.32	6.32	1.896	0	0	0	0	0	0	
201 Aggregate Base Course	1,938.00	50	Foreman	1	4.85	4.85	4.85	4.85	4.85	4.85	1.455	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	4.85	9.7	9.7	9.7	9.7	9.7	2.91	0	0	0	0	0	0	
301 Bituminous Prime Coat (RC Cut-Back Asphalt)	13.40	0.3	Foreman	1	5.58	5.58	5.58	0	5.58	0	0	0	0	0	0	5.58	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	5.58	16.74	16.74	0	16.74	0	0	0	0	0	0	16.74	0	
302 Bituminous Tack Coat (Emulsified Asphalt)	4.69	0.3	Foreman	1	1.95	1.95	1.95	0	1.95	0	0	0	0	0	0	1.95	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	1.95	5.85	5.85	0	5.85	0	0	0	0	0	0	5.85	0	
310(1) Bituminous Concrete Surface Course, Hot Laid (Wearing)	6,700.00	171.3	Foreman	1	4.89	4.89	4.89	4.89	4.89	4.89	1.467	0	0	0	0	0	0	
			Skilled Laborer	4	4.89	19.56	19.56	19.56	19.56	19.56	5.868	0	0	0	0	0	0	
			Unskilled Laborer	8	4.89	39.12	39.12	39.12	39.12	39.12	11.736	0	0	0	0	0	0	
310(2) Bituminous Concrete Surface Course, Hot Laid (Binder)	6,700.00	171.3	Foreman	1	4.89	4.89	4.89	4.89	4.89	4.89	1.467	0	0	0	0	0	0	
			Skilled Laborer	4	4.89	19.56	19.56	19.56	19.56	19.56	5.868	0	0	0	0	0	0	
			Unskilled Laborer	8	4.89	39.12	39.12	39.12	39.12	39.12	11.736	0	0	0	0	0	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**43**		**194.67**	**195**	**165**	**195**	**165**	**49**	-	-	-	-	**30**	-	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	-	-	-	-	**1.39**	-	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**48.15**	**456.23**	**432.60**	**1,261.55**	**16.57**	-	-	-	-	**41.76**	-	**2,256.85**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**1,500.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**8,680.00**
			H. TOTAL DIRECT COST (E + F + G)															**12,436.85**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**994.95**
			K. VAT (12% of E + H + I)															**1,611.82**
			L. TOTAL COST (E + H + I + J)															**15,043.62**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
Gravel to Asphalt, Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	195	0.25	48.15
Safety Shoes	man-day	165	2.77	456.23
Safety Vest	man-day	195	2.22	432.60
Working Gloves	man-day	165	7.67	1,261.55
Rubber Boots	man-day	30	1.39	41.76
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	49	0.34	16.57
SUB - TOTAL (A)				**2,256.85**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	3.00	500.00	1,500.00
Health Personnel (Full Time)	1.00	31.00	280.00	8,680.00
SUB - TOTAL (B)				**10,180.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		12,436.85
E.	DIRECT UNIT COST (D/Quantity)		12,436.85
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	994.95	
	3. VAT 12%	1,611.82	
	TOTAL INDIRECT COST		2,606.76
	TOTAL COST (D + F)		15,043.62

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (ROAD - 5)

5. Gravel to Concrete, Assume 1Km. Length, with 38.5 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
105 Sub-Grade Preparation	10,700.00	300	Foreman	1	4.46	4.46	4.46	4.46	4.46	4.46	1.338	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	4.46	8.92	8.92	8.92	8.92	8.92	2.676	0	0	0	0	0	0	
200 Aggregate Subbase Course	2,872.00	50	Foreman	1	7.18	7.18	7.18	7.18	7.18	7.18	2.154	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	7.18	14.36	14.36	14.36	14.36	14.36	4.308	0	0	0	0	0	0	
201 Aggregate Base Course (Shoulder)	420.00	50	Foreman	1	1.05	1.05	1.05	1.05	1.05	1.05	0.315	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	1.05	2.1	2.1	2.1	2.1	2.1	0.63	0	0	0	0	0	0	
311 PCCP (0.23m. Thk)	6,700.00	70	Foreman	1	11.96	11.96	11.96	0	11.96	0	0	0	0	0	0	11.96	0	
			Skilled Laborer	4	11.96	47.84	47.84	0	47.84	0	0	0	0	0	0	47.84	0	
			Unskilled Laborer	12	11.96	143.52	143.52	0	143.52	0	0	0	0	0	0	143.52	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**26**		**241**	**241**	**38**	**241**	**38**	**11**	**-**	**-**	**-**	**-**	**203**	**-**	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	**-**	**-**	**-**	**-**	**1.39**	**-**	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**59.70**	**105.55**	**536.42**	**291.87**	**3.83**	**-**	**-**	**-**	**-**	**281.86**	**-**	**1,279.24**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**1,500.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**10,780.00**
			H. TOTAL DIRECT COST (E + F + G)															**13,559.24**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**1,084.74**
			K. VAT (12% of E + H + I)															**1,757.28**
			L. TOTAL COST (E + H + I + J)															**16,401.26**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
Gravel to Concrete, Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	241	0.25	59.70
Safety Shoes	man-day	38	2.77	105.55
Safety Vest	man-day	241	2.22	536.42
Working Gloves	man-day	38	7.67	291.87
Rubber Boots	man-day	203	1.39	281.86
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	11	0.34	3.83
SUB - TOTAL (A)				**1,279.24**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	3.00	500.00	1,500.00
Health Personnel (Full Time)	1.00	38.50	280.00	10,780.00
SUB - TOTAL (B)				**12,280.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		13,559.24
E.	DIRECT UNIT COST (D/Quantity)		13,559.24
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	1,084.74	
	3. VAT 12%	1,757.28	
	TOTAL INDIRECT COST		2,842.02
	TOTAL COST (D + F)		16,401.26

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (ROAD - 6)

6. Asphalt Overlay, Assume 1Km. Length, with 14 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
SPL Surface Project (Sealing /Patching)	6,700.00	1000	Foreman	1	0.84	0.84	0.84	0.84	0.84	0.84	0.252	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	6	0.84	5.04	5.04	5.04	5.04	5.04	1.512	0	0	0	0	0	0	
302 Bituminous Tack Coat (Emulsified Asphalt)	4.69	0.3	Foreman	1	1.95	1.95	1.95	0	1.95	1.95	0.585	0	0	0	0	1.95	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	1.95	5.85	5.85	0	5.85	5.85	1.755	0	0	0	0	5.85	0	
310(1) Bituminous Concrete Surface Course, Hot Laid	6,700.00	171.3	Foreman	1	4.89	4.89	4.89	4.89	4.89	4.89	1.467	0	0	0	0	0	0	
			Skilled Laborer	4	4.89	19.56	19.56	19.56	19.56	19.56	5.868	0	0	0	0	0	0	
			Unskilled Laborer	8	4.89	39.12	39.12	39.12	39.12	39.12	11.736	0	0	0	0	0	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**24**		**77**	**77**	**69**	**77**	**77**	**23**	-	-	-	-	**8**	-	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	-	-	-	-	**1.39**	-	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**19.11**	**192.56**	**171.67**	**592.25**	**7.78**	-	-	-	-	**10.81**	-	**994.17**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**500.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**3,920.00**
			H. TOTAL DIRECT COST (E + F + G)															**5,414.17**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**433.13**
			K. VAT (12% of E + H + I)															**701.68**
			L. TOTAL COST (E + H + I + J)															**6,548.98**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
Asphalt Overlay, Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	77	0.25	19.11
Safety Shoes	man-day	69	2.77	192.56
Safety Vest	man-day	77	2.22	171.67
Working Gloves	man-day	77	7.67	592.25
Rubber Boots	man-day	8	1.39	10.81
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	23	0.34	7.78
SUB - TOTAL (A)				**994.17**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	1.00	500.00	500.00
Health Personnel (Full Time)	1.00	14.00	280.00	3,920.00
SUB - TOTAL (B)				**4,420.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		5,414.17
E.	DIRECT UNIT COST (D/Quantity)		5,414.17
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	433.13	
	3. VAT 12%	701.68	
	TOTAL INDIRECT COST		1,134.81
	TOTAL COST (D + F)		6,548.98

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (ROAD - 7)

7. Concrete Reblocking (30% of Existing PCCP), Assume 1Km. Length, with 25.5 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
101(1) Removal of Deteriorated Subbase	402.00	20	Foreman	1	2.51	2.51	2.51	2.51	2.51	2.51	0.753	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	2.51	5.02	5.02	5.02	5.02	5.02	1.506	0	0	0	0	0	0	
101(2) Removal of Structure (PCCP, t=0.23m.)	2,010.00	24	Foreman	1	10.47	10.47	10.47	10.47	10.47	10.47	3.141	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	10.47	20.94	20.94	20.94	20.94	20.94	6.282	0	0	0	0	0	0	
200 Aggregate Subbase Course	402.00	30	Foreman	1	1.68	1.68	1.68	1.68	1.68	1.68	0.504	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	1.68	3.36	3.36	3.36	3.36	3.36	1.008	0	0	0	0	0	0	
302 Bituminous Tack Coat (Emulsified Asphalt)	4.69	0.3	Foreman	1	1.95	1.95	1.95	0	1.95	1.95	0.585	0	0	0	0	1.95	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	1.95	5.85	5.85	0	5.85	5.85	1.755	0	0	0	0	5.85	0	
310 Bituminous Concrete Surface Course, Hot Laid	6,700.00	171.3	Foreman	1	4.89	4.89	4.89	4.89	4.89	4.89	1.467	0	0	0	0	0	0	
			Skilled Laborer	4	4.89	19.56	19.56	19.56	19.56	19.56	5.868	0	0	0	0	0	0	
			Unskilled Laborer	8	4.89	39.12	39.12	39.12	39.12	39.12	11.736	0	0	0	0	0	0	
311 PCCP (0.23m. Thk)	2,010.00	70	Foreman	1	3.59	3.59	3.59	0	3.59	3.59	1.077	0	0	0	0	3.59	0	
			Skilled Laborer	4	3.59	14.36	14.36	0	14.36	14.36	4.308	0	0	0	0	14.36	0	
			Unskilled Laborer	12	3.59	43.08	43.08	0	43.08	43.08	12.924	0	0	0	0	43.08	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**43**		**176**	**176**	**108**	**176**	**176**	**53**	**-**	**-**	**-**	**-**	**69**	**-**	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	**-**	**-**	**-**	**-**	**1.39**	**-**	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**43.62**	**298.19**	**391.96**	**1,352.25**	**17.76**	**-**	**-**	**-**	**-**	**95.42**	**-**	**2,199.20**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**1,000.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**7,140.00**
			H. TOTAL DIRECT COST (E + F + G)															**10,339.20**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**827.14**
			K. VAT (12% of E + H + I)															**1,339.96**
			L. TOTAL COST (E + H + I + J)															**12,506.29**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
Concrete Reblocking (30% of Existing PCCP), Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	176	0.25	43.62
Safety Shoes	man-day	108	2.77	298.19
Safety Vest	man-day	176	2.22	391.96
Working Gloves	man-day	176	7.67	1,352.25
Rubber Boots	man-day	69	1.39	95.42
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	53	0.34	17.76
SUB - TOTAL (A)				**2,199.20**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	2.00	500.00	1,000.00
Health Personnel (Full Time)	1.00	25.50	280.00	7,140.00
SUB - TOTAL (B)				**8,140.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		10,339.20
E.	DIRECT UNIT COST (D/Quantity)		10,339.20
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	827.14	
	3. VAT 12%	1,339.96	
	TOTAL INDIRECT COST		2,167.10
	TOTAL COST (D + F)		12,506.29

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (ROAD - 8)

8. Concrete Reblocking (50% of Existing PCCP), Assume 1Km. Length, with 36 C.D Duration

ITEM NO. / DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
101(1) Removal of Deteriorated Subbase	402.00	20	Foreman	1	2.51	2.51	2.51	2.51	2.51	2.51	0.753	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	2.51	5.02	5.02	5.02	5.02	5.02	1.506	0	0	0	0	0	0	
101(2) Removal of Structure (PCCP, t=0.23m.)	3,350.00	24	Foreman	1	17.45	17.45	17.45	17.45	17.45	17.45	5.235	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	17.45	34.9	34.9	34.9	34.9	34.9	10.47	0	0	0	0	0	0	
200 Aggregate Subbase Course	670.00	30	Foreman	1	2.79	2.79	2.79	2.79	2.79	2.79	0.837	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	2.79	5.58	5.58	5.58	5.58	5.58	1.674	0	0	0	0	0	0	
302 Bituminous Tack Coat (Emulsified Asphalt)	4.69	0.3	Foreman	1	1.95	1.95	1.95	0	1.95	1.95	0.585	0	0	0	0	1.95	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	1.95	5.85	5.85	0	5.85	5.85	1.755	0	0	0	0	5.85	0	
310 Bituminous Concrete Surface Course, Hot Laid	6,700.00	171.3	Foreman	1	4.89	4.89	4.89	4.89	4.89	4.89	1.467	0	0	0	0	0	0	
			Skilled Laborer	4	4.89	19.56	19.56	19.56	19.56	19.56	5.868	0	0	0	0	0	0	
			Unskilled Laborer	8	4.89	39.12	39.12	39.12	39.12	39.12	11.736	0	0	0	0	0	0	
311 PCCP (0.23m. Thk)	3,350.00	70	Foreman	1	5.98	5.98	5.98	0	5.98	5.98	1.794	0	0	0	0	5.98	0	
			Skilled Laborer	4	5.98	23.92	23.92	0	23.92	23.92	7.176	0	0	0	0	23.92	0	
			Unskilled Laborer	12	5.98	71.76	71.76	0	71.76	71.76	21.528	0	0	0	0	71.76	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**43**		**241**	**241**	**132**	**241**	**241**	**72**	**-**	**-**	**-**	**-**	**109**	**-**	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	**-**	**-**	**-**	**-**	**1.39**	**-**	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**59.68**	**365.48**	**536.18**	**1,849.81**	**24.29**	**-**	**-**	**-**	**-**	**151.74**	**-**	**2,987.19**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**1,500.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**10,080.00**
			H. TOTAL DIRECT COST (E + F + G)															**14,567.19**
			I. OCM (9% of E)															**-**
			J. PROFIT (8% of E)															**1,165.38**
			K. VAT (12% of E + H + I)															**1,887.91**
			L. TOTAL COST (E + H + I + J)															**17,620.47**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
Concrete Reblocking (50% of Existing PCCP), Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	241	0.25	59.68
Safety Shoes	man-day	132	2.77	365.48
Safety Vest	man-day	241	2.22	536.18
Working Gloves	man-day	241	7.67	1,849.81
Rubber Boots	man-day	109	1.39	151.74
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	72	0.34	24.29
SUB - TOTAL (A)				**2,987.19**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	3.00	500.00	1,500.00
Health Personnel (Full Time)	1.00	36.00	280.00	10,080.00
SUB - TOTAL (B)				**11,580.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		14,567.19
E.	DIRECT UNIT COST (D/Quantity)		14,567.19
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	1,165.38	
	3. VAT 12%	1,887.91	
	TOTAL INDIRECT COST		3,053.28
	TOTAL COST (D + F)		17,620.47

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (ROAD - 9)

9. Re-Gravelling, Assume 1Km. Length, with 10 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
105 Sub-Grade Preparation	10,700.00	300	Foreman	1	4.46	4.46	4.46	4.46	4.46	4.46	1.338	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	4.46	8.92	8.92	8.92	8.92	8.92	2.676	0	0	0	0	0	0	
200 Aggregate Subbase Course	2,140.00	50	Foreman	1	5.35	5.35	5.35	5.35	5.35	5.35	1.605	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	5.35	10.7	10.7	10.7	10.7	10.7	3.21	0	0	0	0	0	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**6**		**29**	**29**	**29**	**29**	**29**	**9**	-	-	-	-	-	-	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	-	-	-	-	-	-	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**7.28**	**81.60**	**65.40**	**225.63**	**2.96**	-	-	-	-	-	-	**382.87**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**500.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**2,800.00**
			H. TOTAL DIRECT COST (E + F + G)															**3,682.87**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**294.63**
			K. VAT (12% of E + H + I)															**477.30**
			L. TOTAL COST (E + H + I + J)															**4,454.80**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
Re-Gravelling, Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	29	0.25	7.28
Safety Shoes	man-day	29	2.77	81.60
Safety Vest	man-day	29	2.22	65.40
Working Gloves	man-day	29	7.67	225.63
Rubber Boots	man-day	-	1.39	-
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	9	0.34	2.96
SUB - TOTAL (A)				**382.87**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	1.00	500.00	500.00
Health Personnel (Full Time)	1.00	10.00	280.00	2,800.00
SUB - TOTAL (B)				**3,300.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		3,682.87
E.	DIRECT UNIT COST (D/Quantity)		3,682.87
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	294.63	
	3. VAT 12%	477.30	
	TOTAL INDIRECT COST		771.93
	TOTAL COST (D + F)		4,454.80

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (ROAD - 10)

10. New Road Opening, Concrete, Assume Embankment H=1.00m., Assume 1Km. Length, with 83 C.D Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
100 Clearing and Grubbing	17,500.00	500	Foreman	1	4.38	4.38	4.38	4.38	4.38	4.38	1.314	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	4.38	8.76	8.76	8.76	8.76	8.76	2.628	0	0	0	0	0	0	
104 Embankment	13,715.00	50	Foreman	1	34.29	34.29	34.29	34.29	34.29	34.29	10.287	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	34.29	68.58	68.58	68.58	68.58	68.58	20.574	0	0	0	0	0	0	
105 Sub-Grade Preparation	16,000.00	300	Foreman	1	6.67	6.67	6.67	6.67	6.67	6.67	2.001	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	6.67	13.34	13.34	13.34	13.34	13.34	4.002	0	0	0	0	0	0	
200 Aggregate Subbase Course	3,430.00	50	Foreman	1	8.58	8.58	8.58	8.58	8.58	8.58	2.574	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	8.58	17.16	17.16	17.16	17.16	17.16	5.148	0	0	0	0	0	0	
311 PCCP (0.23m. Thk)	6,700.00	70	Foreman	1	11.96	11.96	11.96	0	11.96	11.96	3.588	0	0	0	0	11.96	0	
			Skilled Laborer	4	11.96	47.84	47.84	0	47.84	47.84	14.352	0	0	0	0	47.84	0	
			Unskilled Laborer	12	11.96	143.52	143.52	0	143.52	143.52	43.056	0	0	0	0	143.52	0	
103(3) Foundation Fill	8.46	1.25	Foreman	1	0.85	0.85	0.85	0.85	0.85	0.85	0.255	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	4	0.85	3.4	3.4	3.4	3.4	3.4	1.02	0	0	0	0	0	0	
500 Reinforced Concrete Pipe Culvert (910mm dia.)	56.00	1.75	Foreman	1	4.00	4	4	4	4	4	1.2	0	0	0	0	0	0	
			Skilled Laborer	2	4.00	8	8	0	8	8	2.4	0	0	0	0	8	0	
			Unskilled Laborer	4	4.00	16	16	0	16	16	4.8	0	0	0	0	16	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**41**		**397**	**397**	**170**	**397**	**397**	**119**	-	-	-	-	**227**	-	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	-	-	-	-	**1.39**	-	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**98.27**	**471.37**	**882.96**	**3,046.20**	**40.01**	-	-	-	-	**315.13**	-	**4,853.93**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**3,000.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**23,324.00**
			H. TOTAL DIRECT COST (E + F + G)															**31,177.93**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**2,494.23**
			K. VAT (12% of E + H + I)															**4,040.66**
			L. TOTAL COST (E + H + I + J)															**37,712.83**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis

New Road Opening, Concrete, Assume Embankment H=1.00m., Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	397	0.25	98.27
Safety Shoes	man-day	170	2.77	471.37
Safety Vest	man-day	397	2.22	882.96
Working Gloves	man-day	397	7.67	3,046.20
Rubber Boots	man-day	227	1.39	315.13
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	119	0.34	40.01
SUB - TOTAL (A)				**4,853.93**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	6.00	500.00	3,000.00
Health Personnel (Full Time)	1.00	83.30	280.00	23,324.00
SUB - TOTAL (B)				**26,324.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		31,177.93
E.	DIRECT UNIT COST (D/Quantity)		31,177.93
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	2,494.23	
	3. VAT 12%	4,040.66	
	TOTAL INDIRECT COST		6,534.89
	TOTAL COST (D + F)		37,712.83

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (ROAD - 11)

11. New Road Opening, Concrete, Assume Road Cut H=1.00m., Assume 1Km. Length, with 80 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
100 Clearing and Grubbing	17,500.00	500	Foreman	1	4.38	4.38	4.38	4.38	4.38	4.38	1.314	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	4.38	8.76	8.76	8.76	8.76	8.76	2.628	0	0	0	0	0	0	
102 Roadway Excavation	14,834.70	60	Foreman	1	30.91	30.91	30.91	30.91	30.91	30.91	9.273	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	30.91	61.82	61.82	61.82	61.82	61.82	18.546	0	0	0	0	0	0	
105 Sub-Grade Preparation	12,420.00	300	Foreman	1	5.18	5.18	5.18	5.18	5.18	5.18	1.554	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	5.18	10.36	10.36	10.36	10.36	10.36	3.108	0	0	0	0	0	0	
200 Aggregate Subbase Course	3,430.00	50	Foreman	1	8.58	8.58	8.58	8.58	8.58	8.58	2.574	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	8.58	17.16	17.16	17.16	17.16	17.16	5.148	0	0	0	0	0	0	
311 PCCP (0.23m. Thk)	6,700.00	70	Foreman	1	11.96	11.96	11.96	0	11.96	11.96	3.588	0	0	0	0	11.96	0	
			Skilled Laborer	4	11.96	47.84	47.84	0	47.84	47.84	14.352	0	0	0	0	47.84	0	
			Unskilled Laborer	12	11.96	143.52	143.52	0	143.52	143.52	43.056	0	0	0	0	143.52	0	
103(3) Foundation Fill	8.46	1.25	Foreman	1	0.85	0.85	0.85	0.85	0.85	0.85	0.255	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	4	0.85	3.4	3.4	3.4	3.4	3.4	1.02	0	0	0	0	0	0	
500 Reinforced Concrete Pipe Culvert (910mm dia.)	56.00	1.75	Foreman	1	4.00	4	4	4	4	4	1.2	0	0	0	0	0	0	
			Skilled Laborer	2	4.00	8	8	0	8	8	2.4	0	0	0	0	8	0	
			Unskilled Laborer	4	4.00	16	16	0	16	16	4.8	0	0	0	0	16	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**41**		**383**	**383**	**155**	**383**	**383**	**115**	**-**	**-**	**-**	**-**	**227**	**-**	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	**-**	**-**	**-**	**-**	**1.39**	**-**	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**94.66**	**430.86**	**850.49**	**2,934.19**	**38.53**	**-**	**-**	**-**	**-**	**315.13**	**-**	**4,663.86**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**3,000.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**22,400.00**
			H. TOTAL DIRECT COST (E + F + G)															**30,063.86**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**2,405.11**
			K. VAT (12% of E + H + I)															**3,896.28**
			L. TOTAL COST (E + H + I + J)															**36,365.25**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis

New Road Opening, Concrete, Assume Road Cut H=1.00m., Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	383	0.25	94.66
Safety Shoes	man-day	155	2.77	430.86
Safety Vest	man-day	383	2.22	850.49
Working Gloves	man-day	383	7.67	2,934.19
Rubber Boots	man-day	227	1.39	315.13
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	115	0.34	38.53
SUB - TOTAL (A)				**4,663.86**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	6.00	500.00	3,000.00
Health Personnel (Full Time)	1.00	80.00	280.00	22,400.00
SUB - TOTAL (B)				**25,400.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		30,063.86
E.	DIRECT UNIT COST (D/Quantity)		30,063.86
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	2,405.11	
	3. VAT 12%	3,896.28	
	TOTAL INDIRECT COST		6,301.39
	TOTAL COST (D + F)		36,365.25

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (ROAD - 12)

12. Widening Paved, PCCP, Assume 1Km. Length, with 27.5 C.D. Duration

ITEM NO. / DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
100 Clearing and Grubbing	4,000.00	500	Foreman	1	1.00	1	1	1	1	1	0.3	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	1.00	2	2	2	2	2	0.6	0	0	0	0	0	0	
102 Roadway Excavation	2,459.60	20	Foreman	1	15.37	15.37	15.37	15.37	15.37	15.37	4.611	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	15.37	30.74	30.74	30.74	30.74	30.74	9.222	0	0	0	0	0	0	
105 Sub-Grade Preparation	4,000.00	300	Foreman	1	1.67	1.67	1.67	1.67	1.67	1.67	0.501	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	1.67	3.34	3.34	3.34	3.34	3.34	1.002	0	0	0	0	0	0	
200 Aggregate Subbase Course	800.00	50	Foreman	1	2.00	2	2	2	2	2	0.6	0	0	0	0	0	0	
			Skilled Laborer	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	2.00	4	4	4	4	4	1.2	0	0	0	0	0	0	
311 PCCP (0.23m. Thk)	4,000.00	70	Foreman	1	7.14	7.14	7.14	0	7.14	7.14	2.142	0	0	0	0	7.14	0	
			Skilled Laborer	4	7.14	28.56	28.56	0	28.56	28.56	8.568	0	0	0	0	28.56	0	
			Unskilled Laborer	12	7.14	85.68	85.68	0	85.68	85.68	25.704	0	0	0	0	85.68	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**29**		**182**	**182**	**60**	**182**	**182**	**54**	**-**	**-**	**-**	**-**	**121**	**-**	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	**-**	**-**	**-**	**-**	**1.39**	**-**	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**44.89**	**166.69**	**403.33**	**1,391.50**	**18.27**	**-**	**-**	**-**	**-**	**168.27**	**-**	**2,192.96**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**1,000.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**7,700.00**
			H. TOTAL DIRECT COST (E + F + G)															**10,892.96**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**871.44**
			K. VAT (12% of E + H + I)															**1,411.73**
			L. TOTAL COST (E + H + I + J)															**13,176.12**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
Widening Paved, PCCP, Assume 1Km. Length

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	182	0.25	44.89
Safety Shoes	man-day	60	2.77	166.69
Safety Vest	man-day	182	2.22	403.33
Working Gloves	man-day	182	7.67	1,391.50
Rubber Boots	man-day	121	1.39	168.27
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	54	0.34	18.27
SUB - TOTAL (A)				**2,192.96**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	2.00	500.00	1,000.00
Health Personnel (Full Time)	1.00	27.50	280.00	7,700.00
SUB - TOTAL (B)				**8,700.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				-

D.	TOTAL DIRECT COST (A + B + C)		10,892.96
E.	DIRECT UNIT COST (D/Quantity)		10,892.96
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	871.44	
	3. VAT 12%	1,411.73	
	TOTAL INDIRECT COST		2,283.16
	TOTAL COST (D + F)		13,176.12

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

C – 3 Cost of Construction Safety and Health for Bridge

C – 3.1 Checklist of Personal Protective Equipment per Type of Bridge Project

(Note: Checklist of PPEs as reflected herein are the minimum requirements only. Should the Implementing Offices identify the need for inclusion of specialized PPEs, necessary adjustment shall be made accordingly.)

1. RCDG ON RC PILE FOUNDATION, L = 15.00 l.m.

ITEM NO./ DESCRIPTION	WORKERS	NO. OF PERSONNEL	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
SUBSTRUCTURE													
Construction of Embankment & Detour Road	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	0											
	Unskilled Laborer	2	✓	✓	✓	✓	✓						
Structure Excavation (AOWL)	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	0											
	Unskilled Laborer	3	✓	✓	✓	✓	✓						
RC Piles, Furnished and Driven, 0.45x0.45 m.	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	9	✓	✓	✓	✓	✓						
	Unskilled Laborer	13	✓	✓	✓	✓	✓						
RC Test Piles, Furnished and Driven, 0.45x0.45 m.	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	5	✓	✓	✓	✓	✓						
	Unskilled Laborer	5	✓	✓	✓	✓	✓						
Reinforcing Steel Bars, Gr.40 (Substructure)	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	8	✓	✓	✓	✓	✓						
Concrete Class "A"	Foreman	1	✓		✓	✓	✓					✓	
	Skilled Laborer	8	✓		✓	✓	✓					✓	
	Unskilled Laborer	16	✓		✓	✓	✓					✓	
SUPERSTRUCTURE													
Shoring/Falsework to Superstructure	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	8	✓	✓	✓	✓	✓			✓	✓		
	Unskilled Laborer	16	✓	✓	✓	✓	✓			✓	✓		
Concrete Railing Type "B"	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	4	✓	✓	✓	✓	✓						
Structural Steel (Expansion Dam)	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	1	✓	✓	✓	✓	✓						
	Unskilled Laborer	2	✓	✓	✓	✓	✓						
Reinforcing Steel Bars, Gr.40 (Superstructure)	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	8	✓	✓	✓	✓	✓						
Concrete Class "A"	Foreman	1	✓		✓	✓	✓					✓	
	Skilled Laborer	8	✓		✓	✓	✓					✓	
	Unskilled Laborer	16	✓		✓	✓	✓					✓	

2. PSCG ON RC PILE FOUNDATION, L = 15.00 l.m.

ITEM NO./ DESCRIPTION	WORKERS	NO. OF PERSONNEL	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
SUBSTRUCTURE													
	Foreman	1	✓	✓	✓	✓	✓						
Construction of Embankment & Detour Road	Skilled Laborer	0											
	Unskilled Laborer	2	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
Structure Excavation (AOWL)	Skilled Laborer	0											
	Unskilled Laborer	3	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
RC Piles, Furnished and Driven, 0.45x0.45 m.	Skilled Laborer	9	✓	✓	✓	✓	✓						
	Unskilled Laborer	13	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
RC Test Piles, Furnished and Driven, 0.45x0.45 m.	Skilled Laborer	5	✓	✓	✓	✓	✓						
	Unskilled Laborer	5	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
Reinforcing Steel Bars, Gr.40 (Substructure)	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	8	✓	✓	✓	✓	✓						
	Foreman	1	✓		✓	✓	✓					✓	
Concrete Class "A"	Skilled Laborer	8	✓		✓	✓	✓					✓	
	Unskilled Laborer	16	✓		✓	✓	✓					✓	
SUPERSTRUCTURE													
	Foreman	1	✓	✓	✓	✓	✓						
Concrete Railing Type "B"	Skilled Laborer	2	✓	✓	✓	✓	✓			✓	✓		
	Unskilled Laborer	4	✓	✓	✓	✓	✓			✓	✓		
	Foreman	1	✓	✓	✓	✓	✓						
Structural Steel (Expansion Dam)	Skilled Laborer	1	✓	✓	✓	✓	✓						
	Unskilled Laborer	2	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
Reinforcing Steel Bars, Gr.40 (Superstructure)	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	8	✓	✓	✓	✓	✓						
	Foreman	1	✓		✓	✓	✓					✓	
Concrete Class "A"	Skilled Laborer	8	✓		✓	✓	✓					✓	
	Unskilled Laborer	16	✓		✓	✓	✓					✓	
	Foreman	1	✓	✓	✓	✓	✓						
Elastomeric Bearing Pad	Skilled Laborer	0											
	Unskilled Laborer	1	✓	✓	✓	✓	✓						
	Foreman	1	✓		✓	✓	✓					✓	
Prestressed Concrete Girder, L=15.00 m	Skilled Laborer	8	✓		✓	✓	✓					✓	
	Unskilled Laborer	8	✓		✓	✓	✓					✓	

3. RCDG ON BORED PILE FOUNDATION, L = 15.00 l.m.

ITEM NO./ DESCRIPTION	WORKERS	NO. OF PERSONNEL	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
SUBSTRUCTURE													
	Foreman	1	✓	✓	✓	✓	✓						
Construction of Embankment & Detour Road	Skilled Laborer	0											
	Unskilled Laborer	2	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
Structure Excavation (AOWL)	Skilled Laborer	0											
	Unskilled Laborer	3	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
Bored Piles, D=0.80m @ Abutment	Skilled Laborer	14	✓	✓	✓	✓	✓						
	Unskilled Laborer	23	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
Steel Casing @ Abutments, D=0.80m	Skilled Laborer	4	✓	✓	✓	✓	✓						
	Unskilled Laborer	6	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
Reinforcing Steel Bars, Gr.40 (Substructure)	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	8	✓	✓	✓	✓	✓						
	Foreman	1	✓		✓	✓	✓					✓	
Concrete Class "A"	Skilled Laborer	8	✓		✓	✓	✓					✓	
	Unskilled Laborer	16	✓		✓	✓	✓					✓	
	Foreman	1	✓	✓	✓	✓	✓						
Pile Integrity Testing (P.I.T)	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	2	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
High Strain Dynamic (PDA)	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	4	✓	✓	✓	✓	✓						
SUPERSTRUCTURE													
	Foreman	1	✓	✓	✓	✓	✓						
Shoring/Falsework to Superstructure	Skilled Laborer	8	✓	✓	✓	✓	✓			✓	✓		
	Unskilled Laborer	16	✓	✓	✓	✓	✓			✓	✓		
	Foreman	1	✓	✓	✓	✓	✓						
Concrete Railing Type "B"	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	4	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
Structural Steel (Expansion Dam)	Skilled Laborer	1	✓	✓	✓	✓	✓						
	Unskilled Laborer	2	✓	✓	✓	✓	✓						
	Foreman	1	✓	✓	✓	✓	✓						
Reinforcing Steel Bars, Gr.40 (Superstructure)	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	8	✓	✓	✓	✓	✓						
	Foreman	1	✓		✓	✓	✓					✓	
Concrete Class "A"	Skilled Laborer	8	✓		✓	✓	✓					✓	
	Unskilled Laborer	16	✓		✓	✓	✓					✓	

4. PSCG ON BORED PILE FOUNDATION, L = 15.00 l.m.

ITEM NO./ DESCRIPTION	WORKERS	NO. OF PERSONNEL	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES
SUBSTRUCTURE													
Construction of Embankment & Detour Road	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	0											
	Unskilled Laborer	2	✓	✓	✓	✓	✓						
Structure Excavation (AOWL)	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	0											
	Unskilled Laborer	3	✓	✓	✓	✓	✓						
Bored Piles, D=0.80m @ Abutment	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	14	✓	✓	✓	✓	✓						
	Unskilled Laborer	23	✓	✓	✓	✓	✓						
Steel Casing @ Abutments, D=0.80m	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	4	✓	✓	✓	✓	✓						
	Unskilled Laborer	6	✓	✓	✓	✓	✓						
Reinforcing Steel Bars, Gr.40 (Substructure)	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	8	✓	✓	✓	✓	✓						
Concrete Class "A"	Foreman	1	✓		✓	✓	✓					✓	
	Skilled Laborer	8	✓		✓	✓	✓					✓	
	Unskilled Laborer	16	✓		✓	✓	✓					✓	
Pile Integrity Testing (P.I.T)	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	2	✓	✓	✓	✓	✓						
High Strain Dynamic (PDA)	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	4	✓	✓	✓	✓	✓						
SUPERSTRUCTURE													
Concrete Railing Type "B"	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	2	✓	✓	✓	✓	✓			✓	✓		
	Unskilled Laborer	4	✓	✓	✓	✓	✓			✓	✓		
Structural Steel (Expansion Dam)	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	1	✓	✓	✓	✓	✓						
	Unskilled Laborer	2	✓	✓	✓	✓	✓						
Reinforcing Steel Bars, Gr.40 (Superstructure)	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	2	✓	✓	✓	✓	✓						
	Unskilled Laborer	8	✓	✓	✓	✓	✓						
Concrete Class "A"	Foreman	1	✓		✓	✓	✓					✓	
	Skilled Laborer	8	✓		✓	✓	✓					✓	
	Unskilled Laborer	16	✓		✓	✓	✓					✓	
Elastomeric Bearing Pad	Foreman	1	✓	✓	✓	✓	✓						
	Skilled Laborer	0											
	Unskilled Laborer	1	✓	✓	✓	✓	✓						
Prestressed Concrete Girder, L=15.00 m	Foreman	1	✓		✓	✓	✓					✓	
	Skilled Laborer	8	✓		✓	✓	✓					✓	
	Unskilled Laborer	8	✓		✓	✓	✓					✓	

Cost Computation (Bridge)

C – 3.2

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (BRIDGE -1)

1. RCDG ON RC PILE FOUNDATION, L = 15.00 l.m., with 125 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
SUBSTRUCTURE																		
Construction of Embankment & Detour Road	1.00	0.875	Foreman	1	2.00	2	2	2	2	2	0.6	0	0	0	0	0	0	
			Skilled Laborer	0	2.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	2.00	4	4	4	4	4	1.2	0	0	0	0	0	0	
Structure Excavation (AOWL)	36.00	20	Foreman	1	0.23	0.23	0.23	0.23	0.23	0.23	0.069	0	0	0	0	0	0	
			Skilled Laborer	0	0.23	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	0.23	0.69	0.69	0.69	0.69	0.69	0.207	0	0	0	0	0	0	
RC Piles, Furnished and Driven, 0.45x0.45 m.	200.00	7 & 2.4	Foreman	1	13.99	13.99	13.99	13.99	13.99	13.99	4.197	0	0	0	0	0	0	
			Skilled Laborer	9	13.99	125.91	125.91	125.91	125.91	125.91	37.773	0	0	0	0	0	0	
			Unskilled Laborer	13	13.99	181.87	181.87	181.87	181.87	181.87	54.561	0	0	0	0	0	0	
RC Test Piles, Furnished and Driven, 0.45x0.45 m.	54.00	7 & 2.4	Foreman	1	3.78	3.78	3.78	3.78	3.78	3.78	1.134	0	0	0	0	0	0	
			Skilled Laborer	5	3.78	18.9	18.9	18.9	18.9	18.9	5.67	0	0	0	0	0	0	
			Unskilled Laborer	5	3.78	18.9	18.9	18.9	18.9	18.9	5.67	0	0	0	0	0	0	
Reinforcing Steel Bars, Gr.40 (Substructure)	6,358.00	180	Foreman	1	4.42	4.42	4.42	4.42	4.42	4.42	1.326	0	0	0	0	0	0	
			Skilled Laborer	2	4.42	8.84	8.84	8.84	8.84	8.84	2.652	0	0	0	0	0	0	
			Unskilled Laborer	8	4.42	35.36	35.36	35.36	35.36	35.36	10.608	0	0	0	0	0	0	
Concrete Class "A"	42.90	0.526	Foreman	1	10.19	10.19	10.19		10.19	10.19	3.057	0	0	0	0	10.19	0	
			Skilled Laborer	8	10.19	81.52	81.52		81.52	81.52	24.456	0	0	0	0	81.52	0	
			Unskilled Laborer	16	10.19	163.04	163.04		163.04	163.04	48.912	0	0	0	0	163.04	0	
SUPERSTRUCTURE																		
Shoring/Falsework to Superstructure	15.00	0.375	Foreman	1	5.00	5	5	5	5	5	1.5	0	0	0	0	0	0	
			Skilled Laborer	8	5.00	40	40	40	40	40	12	0	0	40	40	0	0	
			Unskilled Laborer	16	5.00	80	80	80	80	80	24	0	0	80	80	0	0	
Concrete Railing Type "B"	30.00	0.625	Foreman	1	6.00	6	6	6	6	6	1.8	0	0	0	0	0	0	
			Skilled Laborer	2	6.00	12	12	12	12	12	3.6	0	0	0	0	0	0	
			Unskilled Laborer	4	6.00	24	24	24	24	24	7.2	0	0	0	0	0	0	
Structural Steel (Expansion Dam)	756.00	500	Foreman	1	0.19	0.19	0.19	0.19	0.19	0.19	0.057	0	0	0	0	0	0	
			Skilled Laborer	1	0.19	0.19	0.19	0.19	0.19	0.19	0.057	0	0	0	0	0	0	
			Unskilled Laborer	2	0.19	0.38	0.38	0.38	0.38	0.38	0.114	0	0	0	0	0	0	
Reinforcing Steel Bars, Gr.40 (Superstructure)	11,936.00	180	Foreman	1	8.29	8.29	8.29	8.29	8.29	8.29	2.487	0	0	0	0	0	0	
			Skilled Laborer	2	8.29	16.58	16.58	16.58	16.58	16.58	4.974	0	0	0	0	0	0	
			Unskilled Laborer	8	8.29	66.32	66.32	66.32	66.32	66.32	19.896	0	0	0	0	0	0	
Concrete Class "A"	57.40	0.476	Foreman	1	15.07	15.07	15.07		15.07	15.07	4.521	0	0	0	0	15.07	0	
			Skilled Laborer	8	15.07	120.56	120.56		120.56	120.56	36.168	0	0	0	0	120.56	0	
			Unskilled Laborer	16	15.07	241.12	241.12		241.12	241.12	72.336	0	0	0	0	241.12	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**149**		**1309**	**1,309**	**678**	**1,309**	**1,309**	**393**	-	-	**120**	**120**	**632**	-	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	-	-	**1.73**	**1.48**	**1.39**	-	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**323.84**	**1,879.38**	**2,909.64**	**10,038.27**	**131.83**	-	-	**207.76**	**178.08**	**875.45**	-	**16,544.25**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**4,500.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**35,000.00**
			H. TOTAL DIRECT COST (E + F + G)															**56,044.25**
			I. OCM (9% of E)															-
			J. PROFIT (8% of E)															**4,483.54**
			K. VAT (12% of E + H + I)															**7,263.33**
			L. TOTAL COST (E + H + I + J)															**67,791.12**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
RCDG ON RC PILE FOUNDATION, L = 15.00 l.m.

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	1,309	0.25	323.84
Safety Shoes	man-day	678	2.77	1,879.38
Safety Vest	man-day	1,309	2.22	2,909.64
Working Gloves	man-day	1,309	7.67	10,038.27
Rubber Boots	man-day	632	1.39	875.45
Body Harness	man-day	120	1.73	207.76
Lanyard	man-day	120	1.48	178.08
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	393	0.34	131.83
SUB - TOTAL (A)				**16,544.25**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	9.00	500.00	4,500.00
Health Personnel (Full Time)	1.00	125.00	280.00	35,000.00
SUB - TOTAL (B)				**39,500.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		56,044.25
E.	DIRECT UNIT COST (D/Quantity)		56,044.25
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	4,483.54	
	3. VAT 12%	7,263.33	
	TOTAL INDIRECT COST		11,746.87
	TOTAL COST (D + F)		67,791.12

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (BRIDGE -2)

2. PSCG ON RC PILE FOUNDATION, L = 15.00 l.m., with 140 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY VEST	SAFETY SHOES	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
SUBSTRUCTURE																		
Construction of Embankment & Detour Road	1.00	0.875	Foreman	1	2.00	2.00	2.00	2.00	2.00	2.00	0.60	0	0	0	0	0	0	
			Skilled Laborer	0	2.00	0	0	0	0.00	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	2.00	4.00	4.00	4.00	4.00	4.00	1.20	0	0	0	0	0	0	
Structure Excavation (AOWL)	36.00	20	Foreman	1	0.23	0.23	0.23	0.23	0.23	0.23	0.069	0	0	0	0	0	0	
			Skilled Laborer	0	0.23	0	0	0	0.00	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	0.23	0.69	0.69	0.69	0.69	0.69	0.207	0	0	0	0	0	0	
RC Piles, Furnished and Driven, 0.45x0.45 m.	200.00	7 & 2.4	Foreman	1	13.99	13.99	13.99	13.99	13.99	13.99	4.197	0	0	0	0	0	0	
			Skilled Laborer	9	13.99	125.91	125.91	125.91	125.91	125.91	37.773	0	0	0	0	0	0	
			Unskilled Laborer	13	13.99	181.87	181.87	181.87	181.87	181.87	54.561	0	0	0	0	0	0	
RC Test Piles, Furnished and Driven, 0.45x0.45 m.	54.00	7 & 2.4	Foreman	1	3.78	3.78	3.78	3.78	3.78	3.78	1.134	0	0	0	0	0	0	
			Skilled Laborer	5	3.78	18.9	18.9	18.9	18.90	18.9	5.67	0	0	0	0	0	0	
			Unskilled Laborer	5	3.78	18.9	18.9	18.9	18.90	18.9	5.67	0	0	0	0	0	0	
Reinforcing Steel Bars, Gr.40 (Substructure)	8,272.00	180	Foreman	1	5.74	5.74	5.74	5.74	5.74	5.74	1.722	0	0	0	0	0	0	
			Skilled Laborer	2	5.74	11.48	11.48	11.48	11.48	11.48	3.444	0	0	0	0	0	0	
			Unskilled Laborer	8	5.74	45.92	45.92	45.92	45.92	45.92	13.776	0	0	0	0	0	0	
Concrete Class "A"	45.50	0.526	Foreman	1	10.81	10.81	10.81	10.81	0.00	10.81	3.243	0	0	0	0	10.81	0	
			Skilled Laborer	8	10.81	86.48	86.48	86.48	0.00	86.48	25.944	0	0	0	0	86.48	0	
			Unskilled Laborer	16	10.81	172.96	172.96	172.96	0.00	172.96	51.888	0	0	0	0	172.96	0	
SUPERSTRUCTURE																		
Concrete Railing Type "B"	30.00	0.625	Foreman	1	6.00	6	6	6	6.00	6	1.8	0	0	0	0	0	0	
			Skilled Laborer	2	6.00	12	12	12	12.00	12	3.6	0	0	12	12	0	0	
			Unskilled Laborer	4	6.00	24	24	24	24.00	24	7.2	0	0	24	24	0	0	
Structural Steel (Expansion Dam)	756.00	500	Foreman	1	0.19	0.19	0.19	0.19	0.19	0.19	0.057	0	0	0	0	0	0	
			Skilled Laborer	1	0.19	0.19	0.19	0.19	0.19	0.19	0.057	0	0	0	0	0	0	
			Unskilled Laborer	2	0.19	0.38	0.38	0.38	0.38	0.38	0.114	0	0	0	0	0	0	
Reinforcing Steel Bars, Gr.40 (Superstructure)	5,589.75	180	Foreman	1	3.88	3.88	3.88	3.88	3.88	3.88	1.164	0	0	0	0	0	0	
			Skilled Laborer	2	3.88	7.76	7.76	7.76	7.76	7.76	2.328	0	0	0	0	0	0	
			Unskilled Laborer	8	3.88	31.04	31.04	31.04	31.04	31.04	9.312	0	0	0	0	0	0	
Concrete Class "A"	33.45	0.476	Foreman	1	8.78	8.78	8.78	8.78	0.00	8.78	2.634	0	0	0	0	8.78	0	
			Skilled Laborer	8	8.78	70.24	70.24	70.24	0.00	70.24	21.072	0	0	0	0	70.24	0	
			Unskilled Laborer	16	8.78	140.48	140.48	140.48	0.00	140.48	42.144	0	0	0	0	140.48	0	
Elastomeric Bearing Pad	8.00	1	Foreman	1	1.00	1	1	1	1.00	1	0.3	0	0	0	0	1	0	
			Skilled Laborer	0	1.00	0	0	0	0.00	0	0	0	0	0	0	0	0	
			Unskilled Laborer	1	1.00	1	1	1	1.00	1	0.3	0	0	0	0	1	0	
Prestressed Concrete Girder, L=15.00 m	4.00	0.25	Foreman	1	2.00	2	2	2	0.00	2	0.6	0	0	0	0	2	0	
			Skilled Laborer	8	2.00	16	16	16	0.00	16	4.8	0	0	0	0	16	0	
			Unskilled Laborer	8	2.00	16	16	16	0.00	16	4.8	0	0	0	0	16	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**143**		**1045**	**1045**	**1045**	**521**	**1045**	**313**	**0**	**0**	**36**	**36**	**526**	**0**	
			B. SERVICE LIFE, DAYS				**730**	**180**	**365**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**400.00**	**1,012.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.22**	**2.77**	**7.67**	**0.34**	**-**	**-**	**1.73**	**1.48**	**1.39**	**-**	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**258.36**	**2,321.33**	**1,444.11**	**8,008.60**	**105.18**	**-**	**-**	**62.33**	**53.42**	**728.85**	**-**	**12,982.18**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**5,000.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**39,200.00**
			H. TOTAL DIRECT COST (E + F + G)															**57,182.18**
			I. OCM (9% of E)															**-**
			J. PROFIT (8% of E)															**4,574.57**
			K. VAT (12% of E + H + I)															**7,410.81**
			L. TOTAL COST (E + H + I + J)															**69,167.56**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
PSCG ON RC PILE FOUNDATION, L = 15.00 l.m.

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	1,045	0.25	258.36
Safety Shoes	man-day	521	2.77	1,444.11
Safety Vest	man-day	1,045	2.22	2,321.33
Working Gloves	man-day	1,045	7.67	8,008.60
Rubber Boots	man-day	526	1.39	728.85
Body Harness	man-day	36	1.73	62.33
Lanyard	man-day	36	1.48	53.42
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	313	0.34	105.18
SUB - TOTAL (A)				**12,982.18**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	10.00	500.00	5,000.00
Health Personnel (Full Time)	1.00	140.00	280.00	39,200.00
SUB - TOTAL (B)				**44,200.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		57,182.18
E.	DIRECT UNIT COST (D/Quantity)		57,182.18
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	4,574.57	
	3. VAT 12%	7,410.81	
	TOTAL INDIRECT COST		11,985.38
	TOTAL COST (D + F)		69,167.56

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (BRIDGE -3)

3. RCDG ON BORED PILE FOUNDATION, L = 15.00 l.m., with 105 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
SUBSTRUCTURE																		
Construction of Embankment & Detour Road	1.00	0.875	Foreman	1	2.00	2.00	2.00	2.00	2.00	2.00	0.60	0	0	0	0	0	0	
			Skilled Laborer	0	2.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	2.00	4.00	4.00	4.00	4.00	4.00	1.20	0	0	0	0	0	0	
Structure Excavation (AOWL)	36.00	20	Foreman	1	0.23	0.23	0.23	0.23	0.23	0.23	0.069	0	0	0	0	0	0	
			Skilled Laborer	0	0.23	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	0.23	0.69	0.69	0.69	0.69	0.69	0.207	0	0	0	0	0	0	
Bored Piles, D=0.80m @ Abutment	100.00	1.09	Foreman	1	11.47	11.47	11.47	11.47	11.47	11.47	3.441	0	0	0	0	0	0	
			Skilled Laborer	14	11.47	160.58	160.58	160.58	160.58	160.58	48.174	0	0	0	0	0	0	
			Unskilled Laborer	23	11.47	263.81	263.81	263.81	263.81	263.81	79.143	0	0	0	0	0	0	
Steel Casing @ Abutments, D=0.80m	24.00	2	Foreman	1	1.50	1.5	1.5	1.5	1.5	1.5	0.45	0	0	0	0	0	0	
			Skilled Laborer	4	1.50	6	6	6	6	6	1.8	0	0	0	0	0	0	
			Unskilled Laborer	6	1.50	9	9	9	9	9	2.7	0	0	0	0	0	0	
Reinforcing Steel Bars, Gr.40 (Substructure)	8,272.00	180	Foreman	1	5.74	5.74	5.74	5.74	5.74	5.74	1.722	0	0	0	0	0	0	
			Skilled Laborer	2	5.74	11.48	11.48	11.48	11.48	11.48	3.444	0	0	0	0	0	0	
			Unskilled Laborer	8	5.74	45.92	45.92	45.92	45.92	45.92	13.776	0	0	0	0	0	0	
Concrete Class "A"	45.50	0.526	Foreman	1	10.81	10.81	10.81	0	10.81	10.81	3.243	0	0	0	0	10.81	0	
			Skilled Laborer	8	10.81	86.48	86.48	0	86.48	86.48	25.944	0	0	0	0	86.48	0	
			Unskilled Laborer	16	10.81	172.96	172.96	0	172.96	172.96	51.888	0	0	0	0	172.96	0	
Pile Integrity Testing (P.I.T)	2.00	1	Foreman	1	0.25	0.25	0.25	0.25	0.25	0.25	0.075	0	0	0	0	0	0	
			Skilled Laborer	2	0.25	0.5	0.5	0.5	0.5	0.5	0.15	0	0	0	0	0	0	
			Unskilled Laborer	2	0.25	0.5	0.5	0.5	0.5	0.5	0.15	0	0	0	0	0	0	
High Strain Dynamic (PDA)	1.00	0.03125	Foreman	1	4.00	4	4	4	4	4	1.2	0	0	0	0	0	0	
			Skilled Laborer	2	4.00	8	8	8	8	8	2.4	0	0	0	0	0	0	
			Unskilled Laborer	4	4.00	16	16	16	16	16	4.8	0	0	0	0	0	0	
SUPERSTRUCTURE																		
Shoring/Falsework to Superstructure	15.00	0.375	Foreman	1	5.00	5	5	5	5	5	1.5	0	0	0	0	0	0	
			Skilled Laborer	8	5.00	40	40	40	40	40	12	0	0	40	40	0	0	
			Unskilled Laborer	16	5.00	80	80	80	80	80	24	0	0	80	80	0	0	
Concrete Railing Type "B"	30.00	0.625	Foreman	1	6.00	6	6	6	6	6	1.8	0	0	0	0	0	0	
			Skilled Laborer	2	6.00	12	12	12	12	12	3.6	0	0	0	0	0	0	
			Unskilled Laborer	4	6.00	24	24	24	24	24	7.2	0	0	0	0	0	0	
Structural Steel (Expansion Dam)	756.00	500	Foreman	1	0.19	0.19	0.19	0.19	0.19	0.19	0.057	0	0	0	0	0	0	
			Skilled Laborer	1	0.19	0.19	0.19	0.19	0.19	0.19	0.057	0	0	0	0	0	0	
			Unskilled Laborer	2	0.19	0.38	0.38	0.38	0.38	0.38	0.114	0	0	0	0	0	0	
Reinforcing Steel Bars, Gr.40 (Superstructure)	11,936.00	180	Foreman	1	8.29	8.29	8.29	8.29	8.29	8.29	2.487	0	0	0	0	0	0	
			Skilled Laborer	2	8.29	16.58	16.58	16.58	16.58	16.58	4.974	0	0	0	0	0	0	
			Unskilled Laborer	8	8.29	66.32	66.32	66.32	66.32	66.32	19.896	0	0	0	0	0	0	
Concrete Class "A"	57.40	0.476	Foreman	1	15.07	15.07	15.07		15.07	15.07	4.521	0	0	0	0	15.07	0	
			Skilled Laborer	8	15.07	120.56	120.56		120.56	120.56	36.168	0	0	0	0	120.56	0	
			Unskilled Laborer	16	15.07	241.12	241.12		241.12	241.12	72.336	0	0	0	0	241.12	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**176**		**1458**	**1,458**	**811**	**1,458**	**1,458**	**437**	**-**	**-**	**120**	**120**	**647**	**-**	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	**-**	**-**	**1.73**	**1.48**	**1.39**	**-**	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**360.51**	**2,247.53**	**3,239.16**	**11,175.09**	**146.76**	**-**	**-**	**207.76**	**178.08**	**896.94**	**-**	**18,451.81**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**4,000.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**29,400.00**
			H. TOTAL DIRECT COST (E + F + G)															**51,851.81**
			I. OCM (9% of E)															**-**
			J. PROFIT (8% of E)															**4,148.14**
			K. VAT (12% of E + H + I)															**6,719.99**
			L. TOTAL COST (E + H + I + J)															**62,719.95**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
RCDG ON BORED PILE FOUNDATION, L = 15.00 l.m.

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	1,458	0.25	360.51
Safety Shoes	man-day	811	2.77	2,247.53
Safety Vest	man-day	1,458	2.22	3,239.16
Working Gloves	man-day	1,458	7.67	11,175.09
Rubber Boots	man-day	647	1.39	896.94
Body Harness	man-day	120	1.73	207.76
Lanyard	man-day	120	1.48	178.08
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	437	0.34	146.76
SUB - TOTAL (A)				**18,451.81**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	8.00	500.00	4,000.00
Health Personnel (Full Time)	1.00	105.00	280.00	29,400.00
SUB - TOTAL (B)				**33,400.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		51,851.81
E.	DIRECT UNIT COST (D/Quantity)		51,851.81
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	4,148.14	
	3. VAT 12%	6,719.99	
	TOTAL INDIRECT COST		10,868.14
	TOTAL COST (D + F)		62,719.95

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

DETAILED CALCULATIONS ON COST OF CONSTRUCTION SAFETY AND HEALTH (BRIDGE - 4)

4. PSCG ON BORED PILE FOUNDATION, L = 15.00 l.m., with 105 C.D. Duration

ITEM NO./ DESCRIPTION	QUANTITY	OUTPUT PER HOUR	WORKERS	NO. OF PERSONNEL	DAYS	MAN-DAYS	SAFETY HELMET	SAFETY SHOES	SAFETY VEST	WORKING GLOVES	RAIN COATS	DUST/GAS MASK	EAR MUFF	BODY HARNESS	LANYARD	RUBBER BOOTS	EYE GOGGLES	
SUBSTRUCTURE																		
Construction of Embankment & Detour Road	1.00	0.875	Foreman	1	2.00	2.00	2.00	2.00	2.00	2.00	0.60	0	0	0	0	0	0	
			Skilled Laborer	0	2.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	2	2.00	4.00	4.00	4.00	4.00	4.00	1.20	0	0	0	0	0	0	
Structure Excavation (AOWL)	36.00	20	Foreman	1	0.23	0.23	0.23	0.23	0.23	0.23	0.069	0	0	0	0	0	0	
			Skilled Laborer	0	0.23	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	3	0.23	0.69	0.69	0.69	0.69	0.69	0.207	0	0	0	0	0	0	
Bored Piles, D=0.80m @ Abutment	100.00	1.09	Foreman	1	11.47	11.47	11.47	11.47	11.47	11.47	3.441	0	0	0	0	0	0	
			Skilled Laborer	14	11.47	160.58	160.58	160.58	160.58	160.58	48.174	0	0	0	0	0	0	
			Unskilled Laborer	23	11.47	263.81	263.81	263.81	263.81	263.81	79.143	0	0	0	0	0	0	
Steel Casing @ Abutments, D=0.80m	24.00	2	Foreman	1	1.50	1.5	1.5	1.5	1.5	1.5	0.45	0	0	0	0	0	0	
			Skilled Laborer	4	1.50	6	6	6	6	6	1.8	0	0	0	0	0	0	
			Unskilled Laborer	6	1.50	9	9	9	9	9	2.7	0	0	0	0	0	0	
Reinforcing Steel Bars, Gr.40 (Substructure)	8,272.00	180	Foreman	1	5.74	5.74	5.74	5.74	5.74	5.74	1.722	0	0	0	0	0	0	
			Skilled Laborer	2	5.74	11.48	11.48	11.48	11.48	11.48	3.444	0	0	0	0	0	0	
			Unskilled Laborer	8	5.74	45.92	45.92	45.92	45.92	45.92	13.776	0	0	0	0	0	0	
Concrete Class "A"	45.50	0.526	Foreman	1	10.81	10.81	10.81	0	10.81	10.81	3.243	0	0	0	0	10.81	0	
			Skilled Laborer	8	10.81	86.48	86.48	0	86.48	86.48	25.944	0	0	0	0	86.48	0	
			Unskilled Laborer	16	10.81	172.96	172.96	0	172.96	172.96	51.888	0	0	0	0	172.96	0	
Pile Integrity Testing (P.I.T)	2.00	1	Foreman	1	0.25	0.25	0.25	0.25	0.25	0.25	0.075	0	0	0	0	0	0	
			Skilled Laborer	2	0.25	0.5	0.5	0.5	0.5	0.5	0.15	0	0	0	0	0	0	
			Unskilled Laborer	2	0.25	0.5	0.5	0.5	0.5	0.5	0.15	0	0	0	0	0	0	
High Strain Dynamic (PDA)	1.00	0.03125	Foreman	1	4.00	4	4	4	4	4	1.2	0	0	0	0	0	0	
			Skilled Laborer	2	4.00	8	8	8	8	8	2.4	0	0	0	0	0	0	
			Unskilled Laborer	4	4.00	16	16	16	16	16	4.8	0	0	0	0	0	0	
SUPERSTRUCTURE																		
Concrete Railing Type "B"	30.00	0.625	Foreman	1	6.00	6	6	6	6	6	1.8	0	0	0	0	0	0	
			Skilled Laborer	2	6.00	12	12	12	12	12	3.6	0	0	12	12	0	0	
			Unskilled Laborer	4	6.00	24	24	24	24	24	7.2	0	0	24	24	0	0	
Structural Steel (Expansion Dam)	756.00	500	Foreman	1	0.19	0.19	0.19	0.19	0.19	0.19	0.057	0	0	0	0	0	0	
			Skilled Laborer	1	0.19	0.19	0.19	0.19	0.19	0.19	0.057	0	0	0	0	0	0	
			Unskilled Laborer	2	0.19	0.38	0.38	0.38	0.38	0.38	0.114	0	0	0	0	0	0	
Reinforcing Steel Bars, Gr.40 (Superstructure)	5,589.75	180	Foreman	1	3.88	3.88	3.88	3.88	3.88	3.88	1.164	0	0	0	0	0	0	
			Skilled Laborer	2	3.88	7.76	7.76	7.76	7.76	7.76	2.328	0	0	0	0	0	0	
			Unskilled Laborer	8	3.88	31.04	31.04	31.04	31.04	31.04	9.312	0	0	0	0	0	0	
Concrete Class "A"	33.45	0.476	Foreman	1	8.78	8.78	8.78	0	8.78	8.78	2.634	0	0	0	0	8.78	0	
			Skilled Laborer	8	8.78	70.24	70.24	0	70.24	70.24	21.072	0	0	0	0	70.24	0	
			Unskilled Laborer	16	8.78	140.48	140.48	0	140.48	140.48	42.144	0	0	0	0	140.48	0	
Elastomeric Bearing Pad	8.00	1	Foreman	1	1.00	1	1	1	1	1	0.3	0	0	0	0	0	0	
			Skilled Laborer	0	1.00	0	0	0	0	0	0	0	0	0	0	0	0	
			Unskilled Laborer	1	1.00	1	1	1	1	1	0.3	0	0	0	0	0	0	
Prestressed Concrete Girder, L=15.00 m	4.00	0.25	Foreman	1	2.00	2	2	0	2	2	0.6	0	0	0	0	2	0	
			Skilled Laborer	8	2.00	16	16	0	16	16	4.8	0	0	0	0	16	0	
			Unskilled Laborer	8	2.00	16	16	0	16	16	4.8	0	0	0	0	16	0	
			A. TOTAL, PERSONNEL/MAN-DAYS	**170**		**1163**	**1,163**	**639**	**1,163**	**1,163**	**349**	**-**	**-**	**36**	**36**	**524**	**-**	
			B. SERVICE LIFE, DAYS				**730**	**365**	**180**	**3**	**730**	**1**	**730**	**730**	**730**	**365**	**60**	
			C. PURCHASE COST, PPh				**180.55**	**1,012.00**	**400.00**	**23.00**	**245.00**	**63.25**	**602.60**	**1,263.85**	**1,083.30**	**506.00**	**169.05**	
			D. UNIT COST/MAN-DAY (C ÷ B)				**0.25**	**2.77**	**2.22**	**7.67**	**0.34**	**-**	**-**	**1.73**	**1.48**	**1.39**	**-**	
			E. DIRECT COST FOR PPE's (D x A (Man-days))				**287.61**	**1,772.00**	**2,584.13**	**8,915.26**	**117.08**	**-**	**-**	**62.33**	**53.42**	**726.08**	**-**	**14,517.91**
			F. SAFETY OFFICER/PRACTITIONER (PART TIME) @ P15,000.00/MONTH (AS PER D.O. 56, S2005, consider atleast 4 hours per week)															**4,000.00**
			G. HEALTH PERSONNEL (FULL TIME) @ P8,400.00/MONTH (AS PER D.O. 56, S2005)															**29,400.00**
			H. TOTAL DIRECT COST (E + F + G)															**47,917.91**
			I. OCM (9% of E)															**-**
			J. PROFIT (8% of E)															**3,833.43**
			K. VAT (12% of E + H + I)															**6,210.16**
			L. TOTAL COST (E + H + I + J)															**57,961.50**

Note: Assumed Rain Coats usage, 30% of man-days

Detailed Unit Price Analysis
PSCG ON BORED PILE FOUNDATION, L = 15.00 l.m.

ITEM NO/DESCRIPTION : **B.7 - Construction Safety and Health**
UNIT OF MEASUREMENT : lot
OUTPUT PER HOUR : n/a
QUANTITY : 1.00

A) MATERIALS : COST/UNIT	UNIT	QUANTITY	UNIT RATE	TOTAL COST
Safety Helmet	man-day	1,163	0.25	287.61
Safety Shoes	man-day	639	2.77	1,772.00
Safety Vest	man-day	1,163	2.22	2,584.13
Working Gloves	man-day	1,163	7.67	8,915.26
Rubber Boots	man-day	524	1.39	726.08
Body Harness	man-day	36	1.73	62.33
Lanyard	man-day	36	1.48	53.42
Optional (if necessary)				
Rain Coats (30% of the Duration)	man-day	349	0.34	117.08
SUB - TOTAL (A)				**14,517.91**

B. LABOR COST	QUANTITY		Unit	Total
	No. of Personnel	Total Man-days	Rate	Cost
Safety Practitioner/ Officer (Part Time)	1.00	8.00	500.00	4,000.00
Health Personnel (Full Time)	1.00	105.00	280.00	29,400.00
SUB - TOTAL (B)				**33,400.00**

C. EQUIPMENT COST	QUANTITY		Hourly	Total
	No. of Equipt.	Total Hours	Rate	Cost
-	-	-	-	-
SUB - TOTAL (C)				**-**

D.	TOTAL DIRECT COST (A + B + C)		47,917.91
E.	DIRECT UNIT COST (D/Quantity)		47,917.91
F.	ADD: INDIRECT COST		
	1. OCM (9% of D)	-	
	2. Contractor's Profit (8% of D)	3,833.43	
	3. VAT 12%	6,210.16	
	TOTAL INDIRECT COST		10,043.59
	TOTAL COST (D + F)		57,961.50

Note: Costs as presented herein are intended only to illustrate the derivation of cost. Should there be an increase/decrease in the cost of materials, labor, equipment and on the allowable percentage of mark-up, necessary adjustments shall be made in accordance with the latest approved department issuances.

Cost of Construction Safety & Health for Buildings

C - 4

C - 4.1 Construction Safety Signage for Building Construction

Building Construction Safety Signage		Dimension (Width X Height ,feet)	Materials	Estimated Cost per Signage
Proper PPE Signage		4' X 8'	a.) Tarpaulin b.) 1/2 " Plywood (Back Frame) c.) Miscellaneous (Nails, Tie Wires as hangers, etc.)	506.37
Safety First (SF-1)		4' x 4'		270.87
Safety First (SF-2)		3' x 2'		123.68

Building Construction Safety Signage		Dimension (Width X Height ,feet)	Materials	Estimated Cost per Signage
Hard Hat Area		3' x 2'	a.) Tarpaulin b.) 1/2 " Plywood (Back Frame) c.) Miscellaneous (Nails, Tie Wires as hangers, etc.)	123.68
Danger Deep Excavation		3' x 2'		123.68
Beware Falling Debris		3' x 2'		123.68
Construction Entrance		3' x 2'		123.68
Construction Exit		3' x 2'		123.68

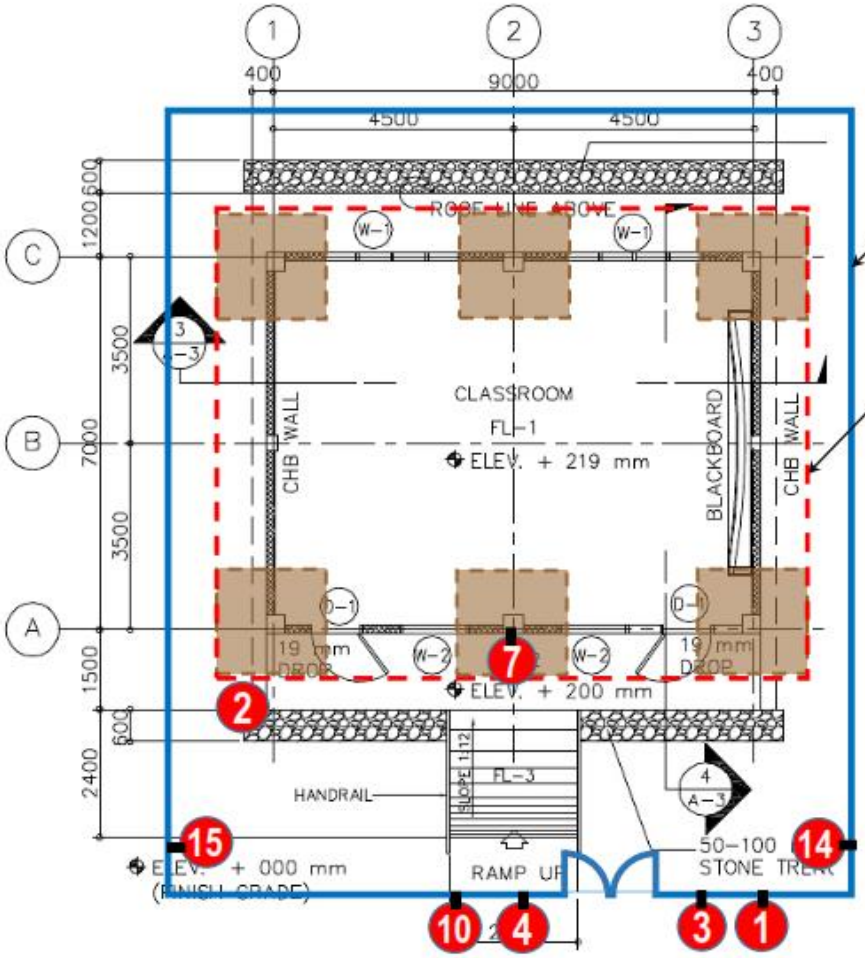
Building Construction Safety Signage		Dimension (Width X Height ,feet)	Materials	Estimated Cost per Signage
Safety Harness Required		3' x 2'	a.) Tarpaulin b.) 1/2 " Plywood (Back Frame) c.) Miscellaneous (Nails, Tie Wires as hangers, etc.)	123.68
Welding /Hot Work Area		3' x 2'		123.68
Authorized Personnel Only		3' x 2'		123.68
Fall Hazard		2' X 3'		123.68
Temporary Materials Stacking Area		3' x 2'		123.68

Building Construction Safety Signage		Dimension (Width X Height ,feet)	Materials	Estimated Cost per Signage
Exit (E-1)		3' x 2'	a.) Tarpaulin b.) 1/2 " Plywood (Back Frame) c.) Miscellaneous (Nails, Tie Wires as hangers, etc.)	123.68
Exit (E-2)		3' x 2'		123.68

Construction Safety Requirements for Standard School Buildings

C – 4.2

4.2.1 Signage and Barricades



1 GROUND FLOOR PLAN

1 Storey - 1 CL

PERIMETER FENCE

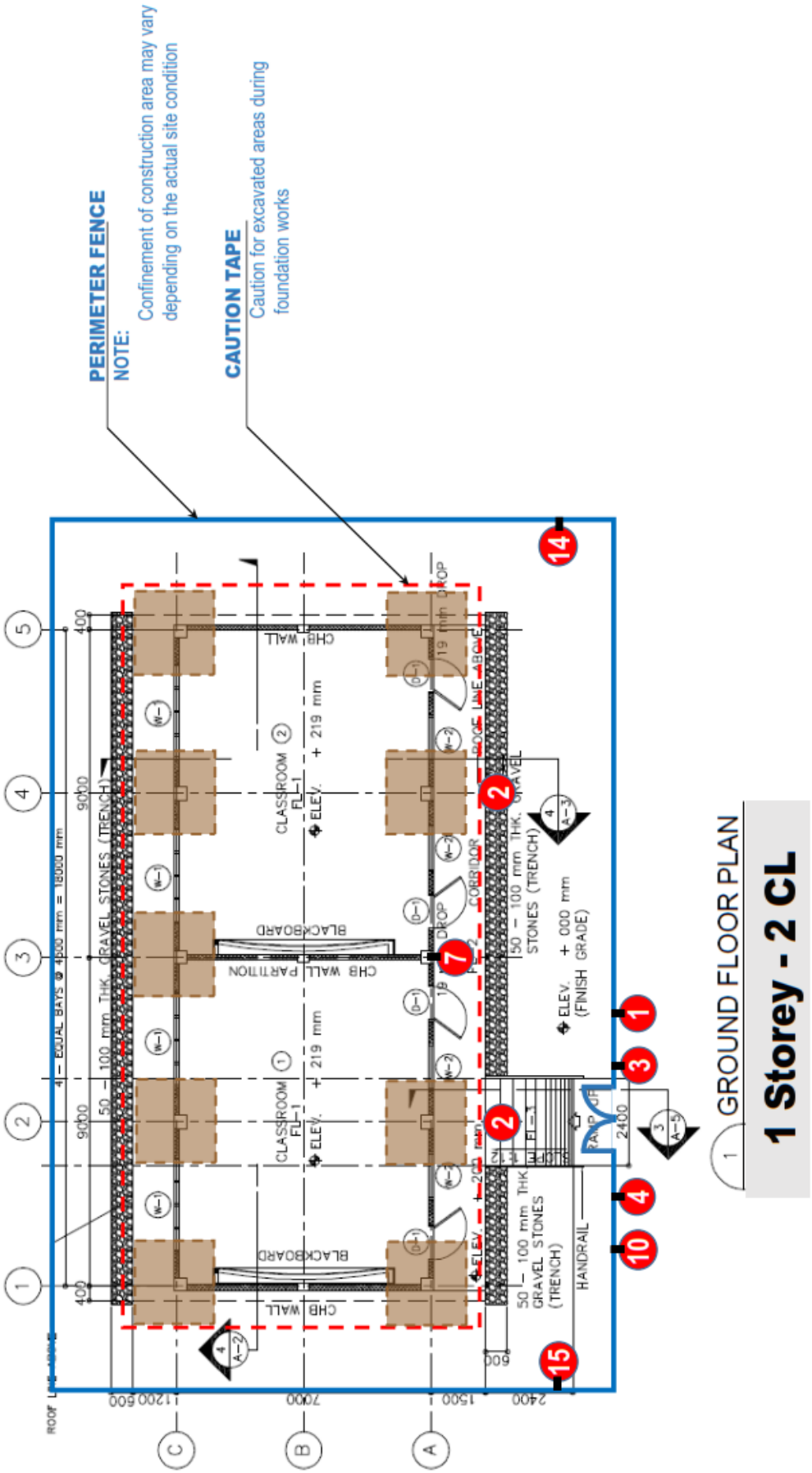
NOTE:

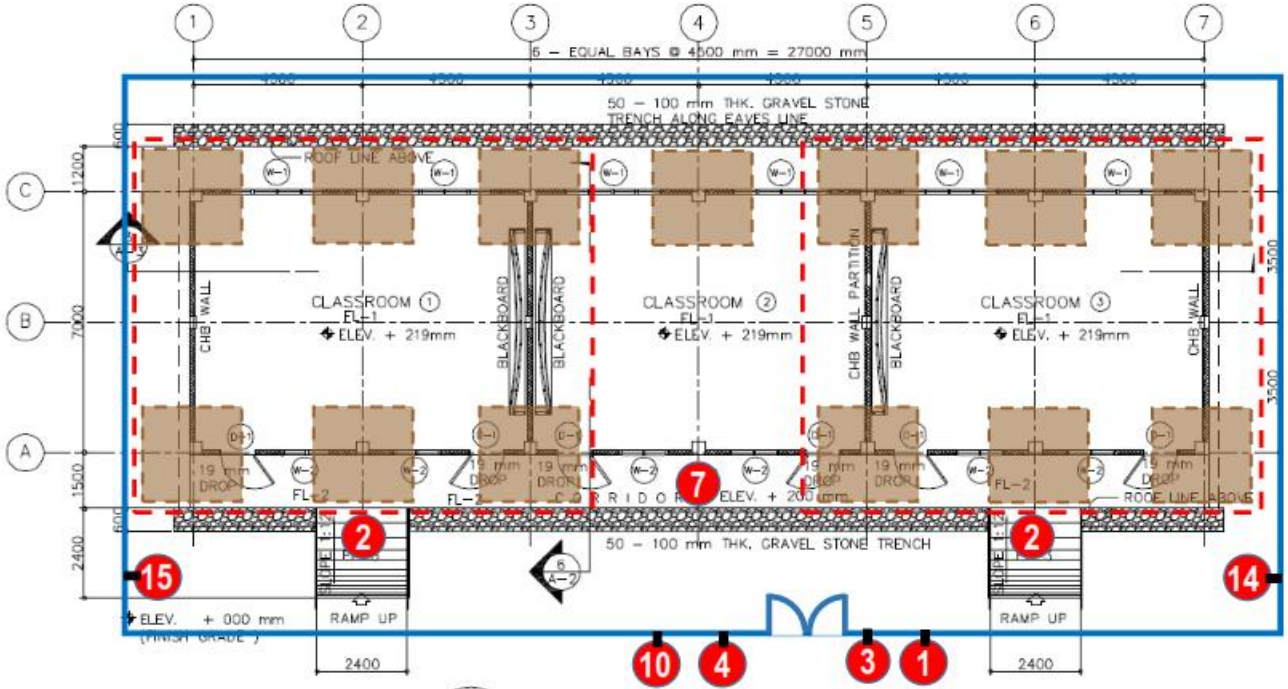
Confinement of construction area may vary depending on the actual site condition

CAUTION TAPE

Caution for excavated areas during foundation works

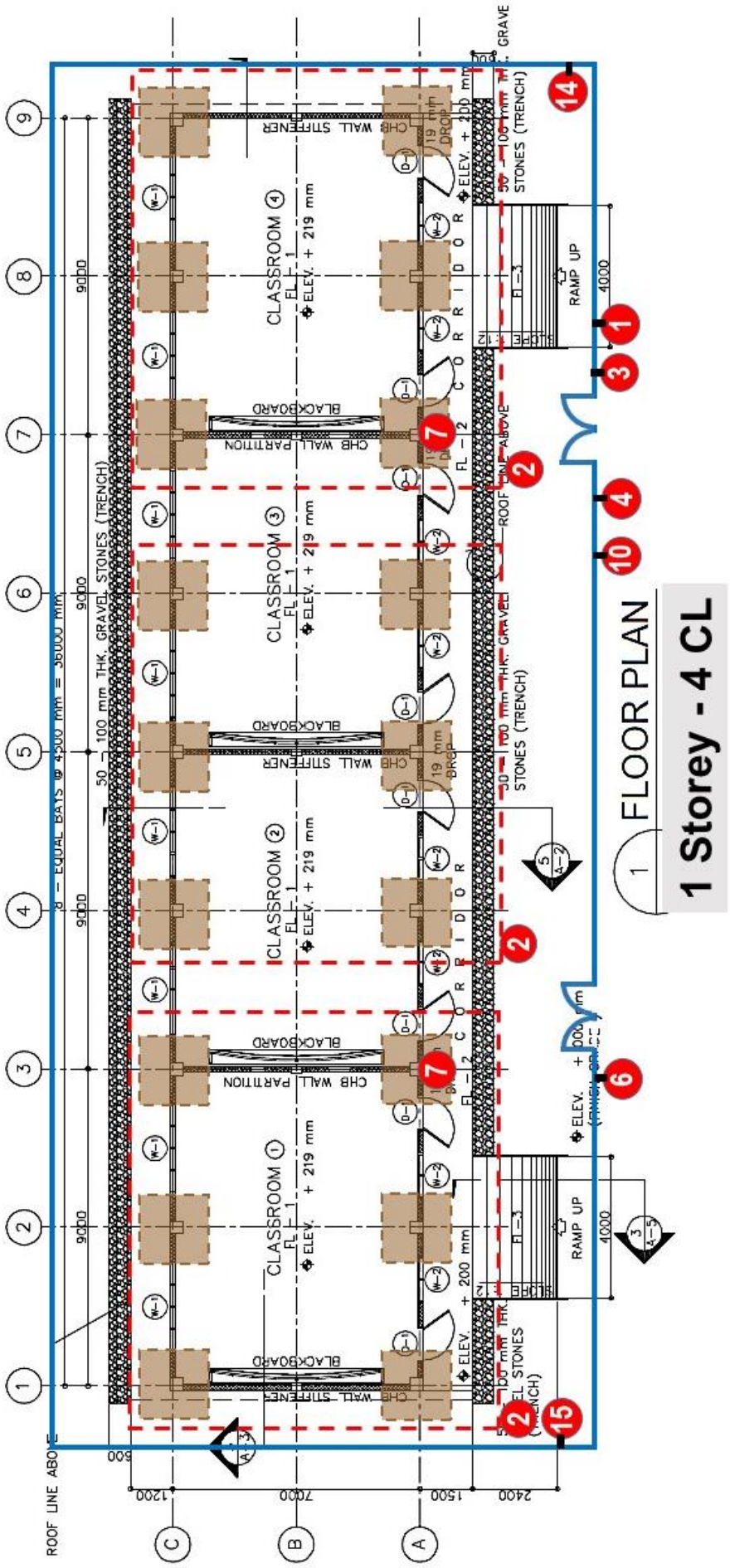
LEGEND :

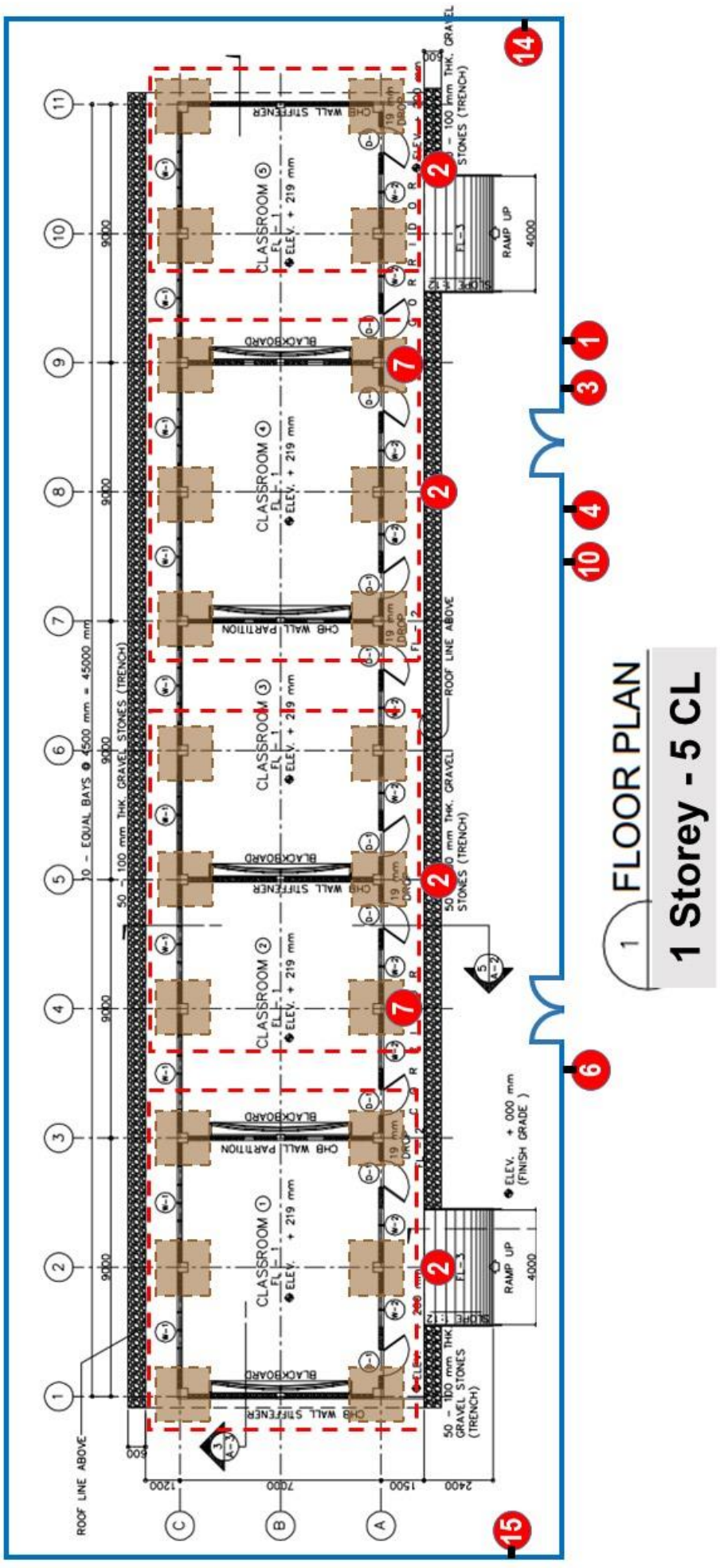

PERIMETER FENCE
NOTE:
Confinement of construction area may vary depending on the actual site condition
CAUTION TAPE
Caution for excavated areas during foundation works
1 GROUND FLOOR PLAN
1 Storey - 2 CL



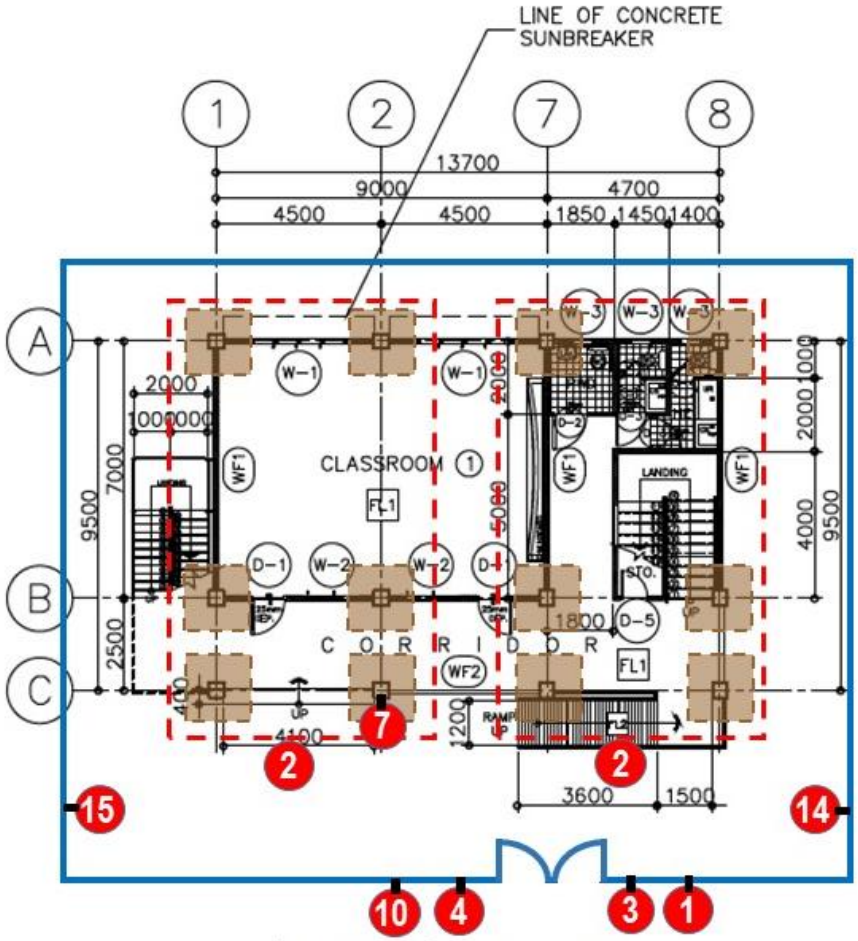
1 GROUND FLOOR PLAN

1 Storey - 3 CL


1 Storey - 4 CL
FLOOR PLAN
CLASSROOM ①
CLASSROOM ②
CLASSROOM ③
CLASSROOM ④
CORRIDOR
RAMP UP
BLACKBOARD
CHB WALL PARTITION
CHB WALL STIFFENER
ROOF LINE ABOVE
8 – EQUAL BAYS @ 4500 mm = 36000 mm
9000
7200
1500
2400
1200

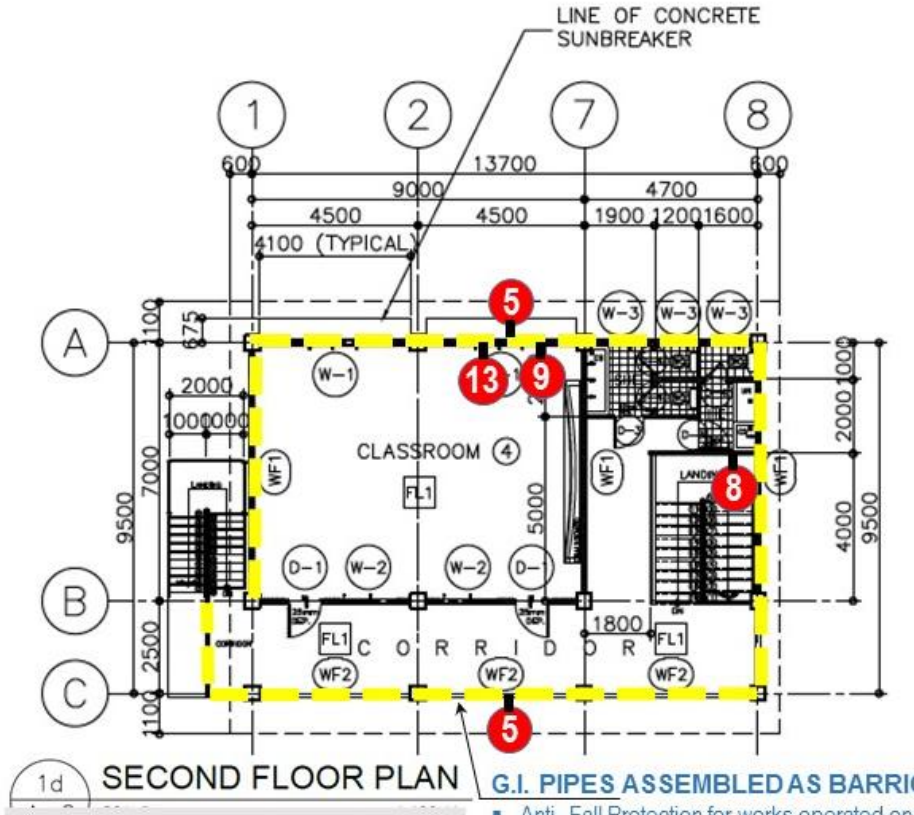

1 FLOOR PLAN
1 Storey - 5 CL
CLASSROOM ①
CLASSROOM ②
CLASSROOM ③
CLASSROOM ④
CLASSROOM ⑤
BLACKBOARD
CHB WALL PARTITION
CHB WALL STIFFENER
ROOF LINE ABOVE
RAMP UP
SLOPE 1:12
50 – 100 mm THK. GRAVEL STONES (TRENCH)
10 – EQUAL BAYS @ 4500 mm = 45000 mm
ELEV. + 000 mm (FINISH GRADE)

2 STOREY – 2 CLASSROOM



1c GROUND FLOOR PLAN

2 Storey - 2 CL



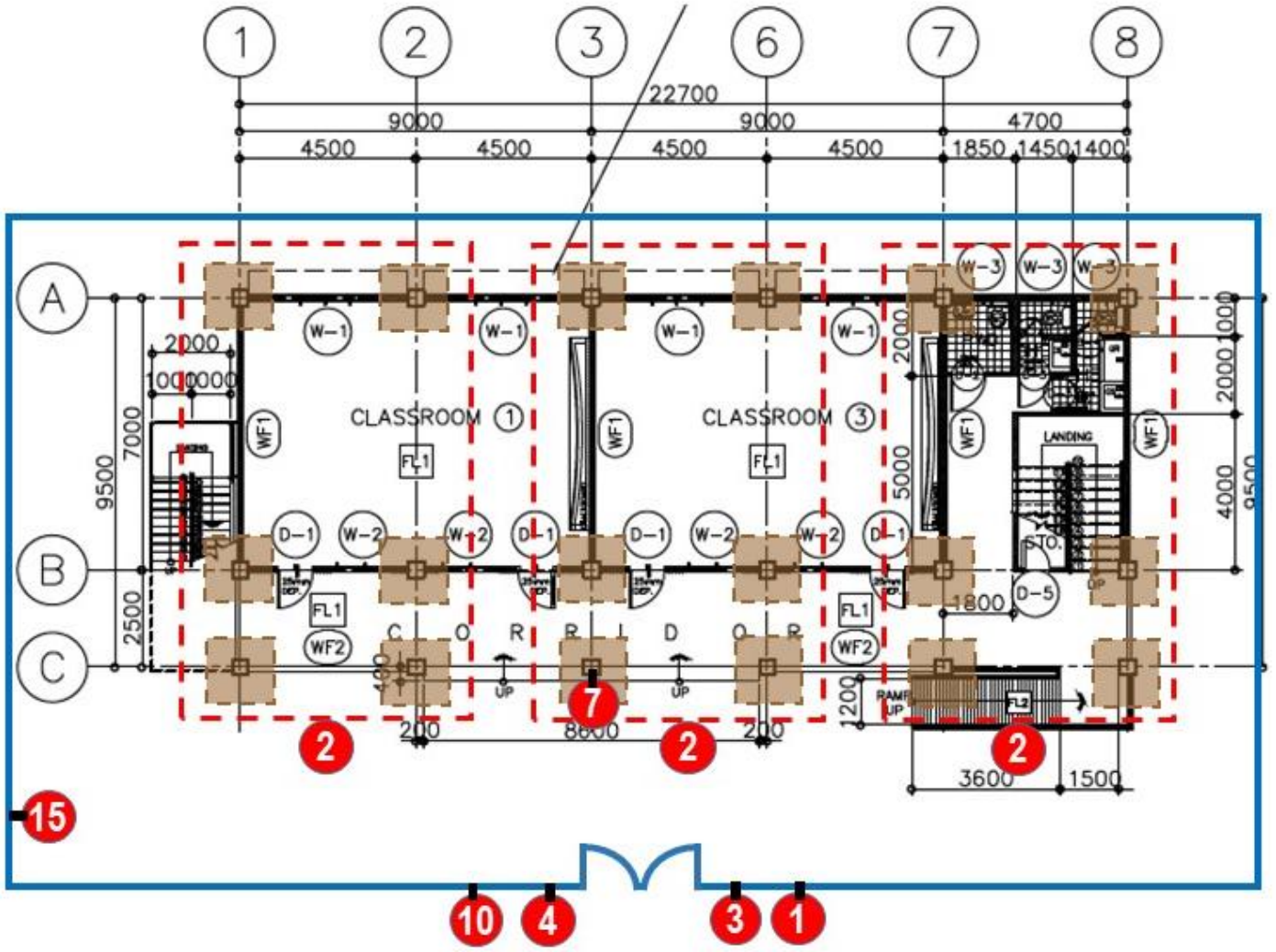
1d SECOND FLOOR PLAN

2 Storey - 2 CL

G.I. PIPES ASSEMBLED AS BARRICADES

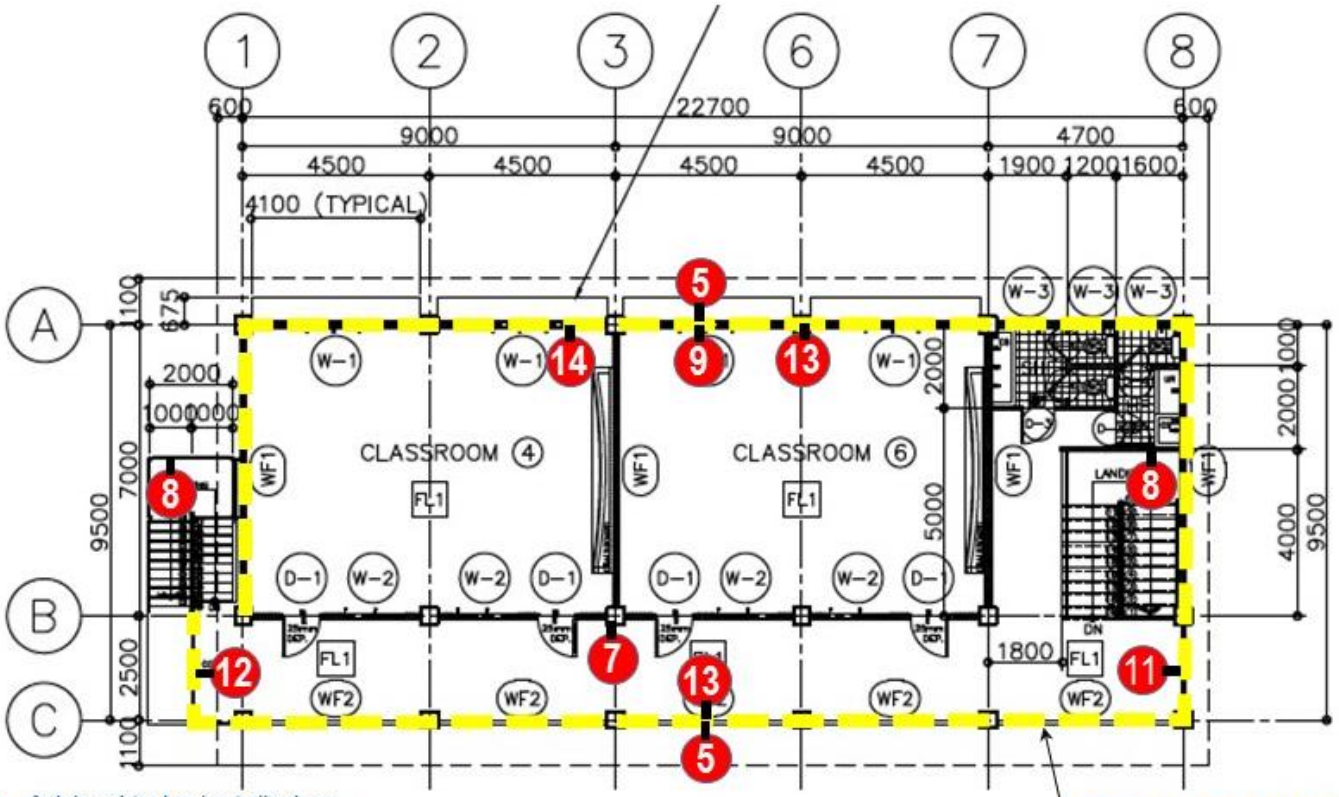
- Anti- Fall Protection for works operated on elevated open areas (confinement of elevated open work areas)
- Advised to be installed along the perimeter of the building during concreting on 2nd floor and up until completion of masonry works

2 STOREY – 4 CLASSROOM



1a GROUND FLOOR PLAN

2 Storey - 4 CL



14 **CAUTION**
HOT WORK AREA

- Advised to be installed on area where welding works for steel roof framing are on-going

9 **DANGER**
Safety harness required

- Advised to be installed atop roof beam during installation of trusses and purlins (2 Storey and up)

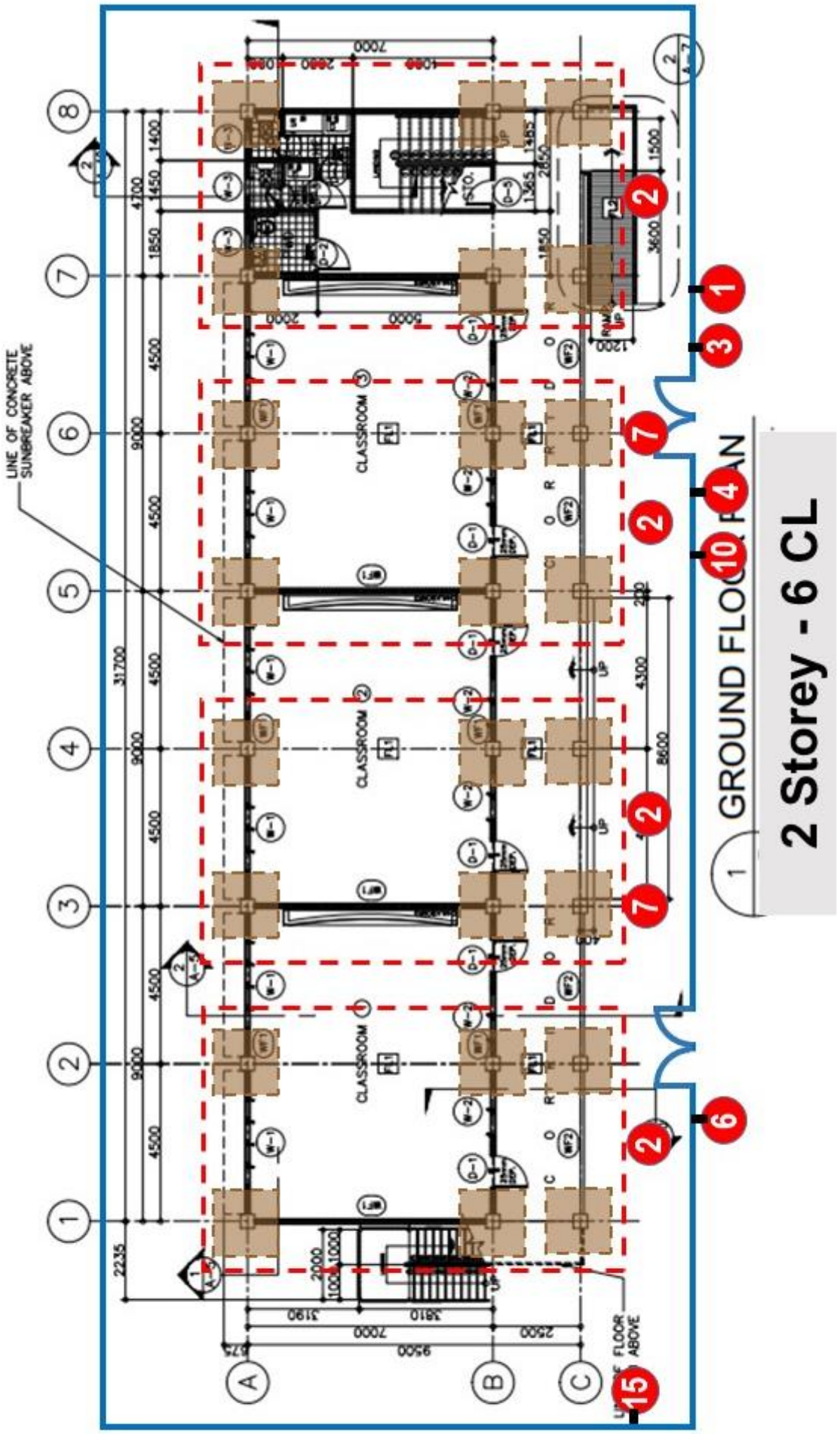
1b SECOND FLOOR PLAN

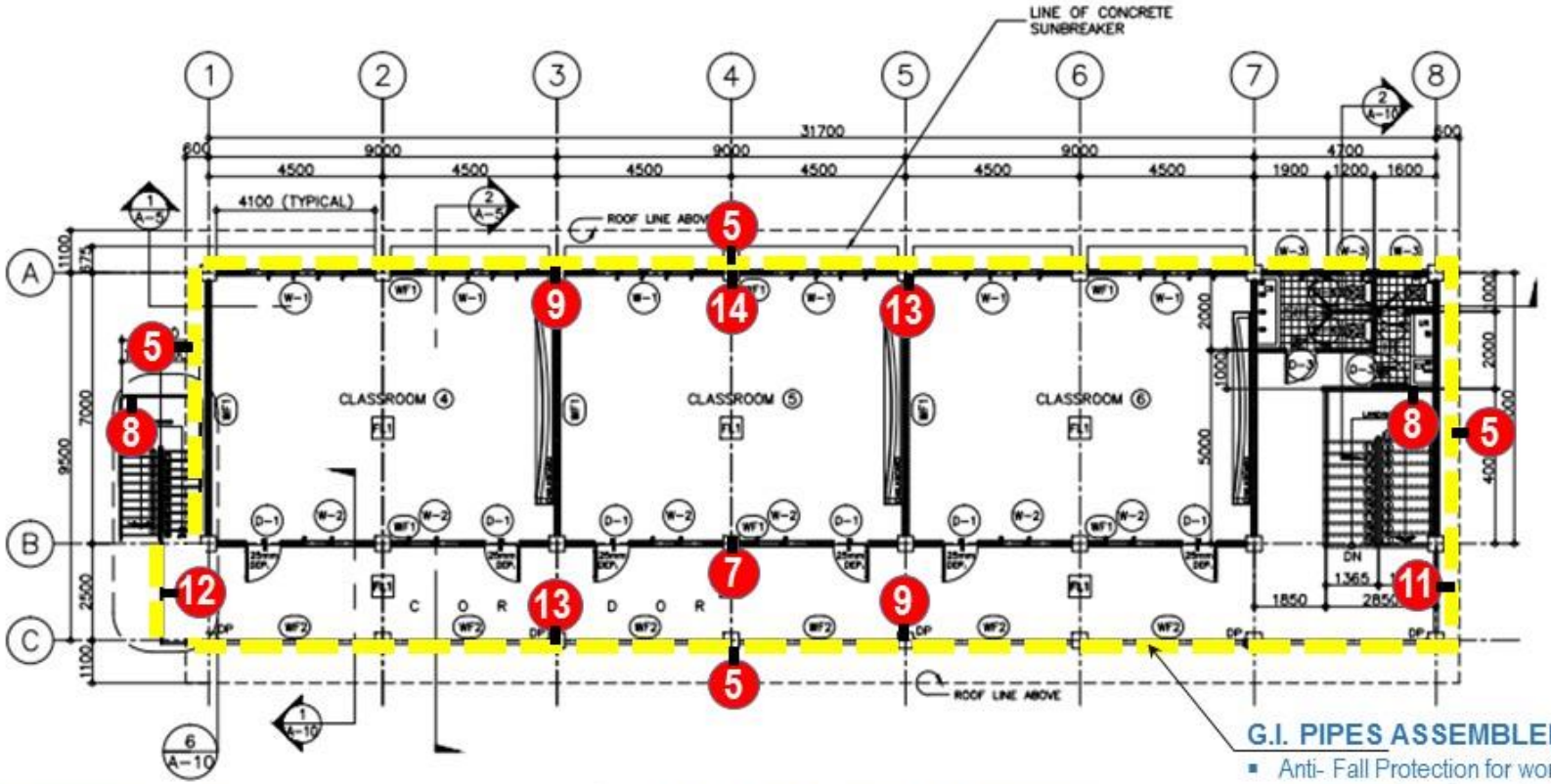
2 Storey - 4 CL

G.I. PIPES ASSEMBLED AS BARRICADES

- Anti- Fall Protection for works operated on elevated open areas (confinement of elevated open work areas)
- Advised to be installed along the perimeter of the building during concreting on 2nd floor and up until completion of masonry works

2 STOREY – 6 CLASSROOM


2 Storey - 6 CL
GROUND FLOOR PLAN
LINE OF CONCRETE SUNBREAKER ABOVE
CLASSROOM
CLASSROOM
CLASSROOM
LINE OF FLOOR ABOVE



2 SECOND FLOOR PLAN

2 Storey - 6 CL

G.I. PIPES ASSEMBLED AS BARRICADES

- Anti- Fall Protection for works operated on elevated open areas (confinement of elevated open work areas)
- Advised to be installed along the perimeter of the building during concreting on 2nd floor and up until completion of masonry works

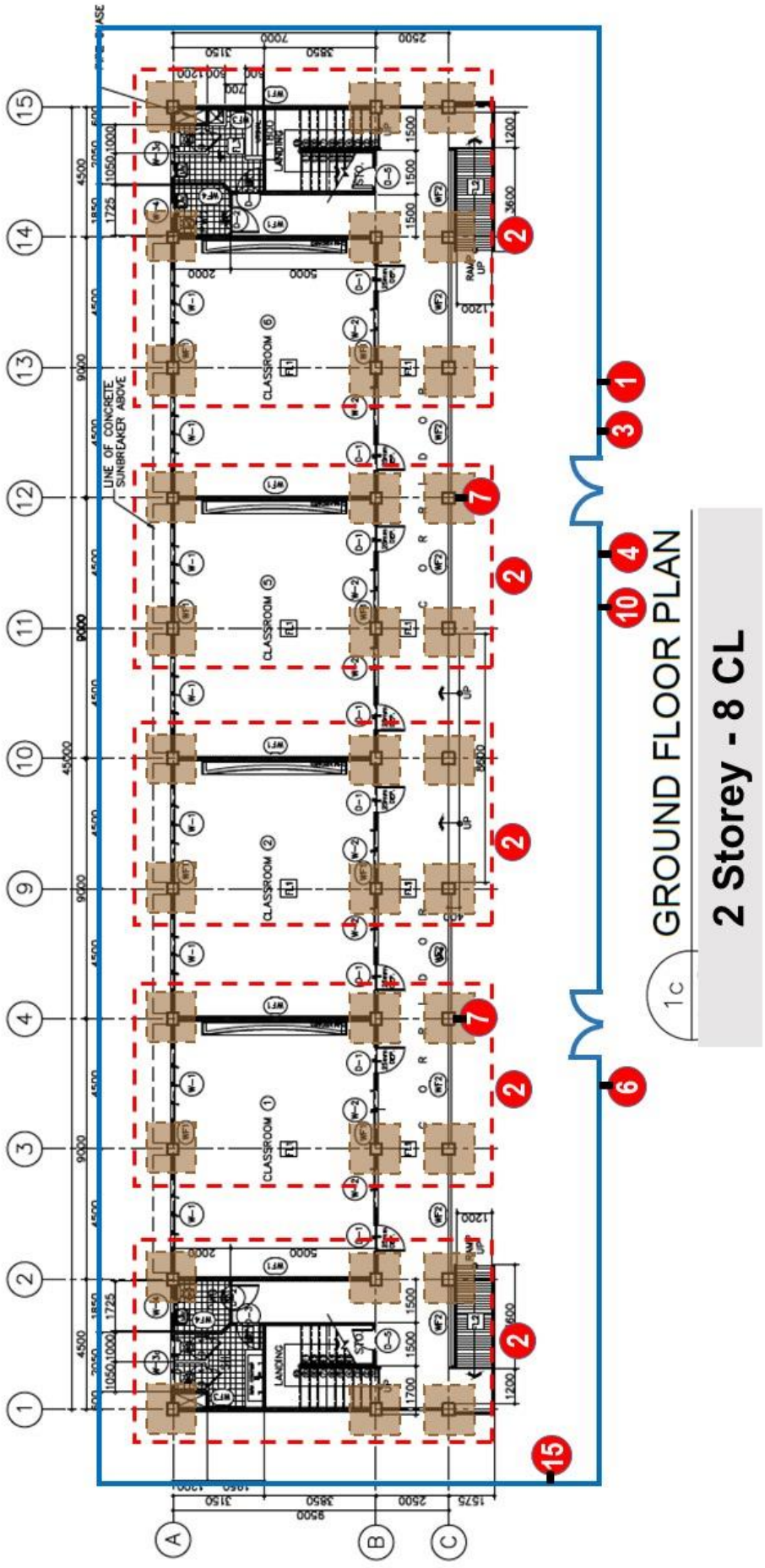
14 CAUTION HOT WORK AREA

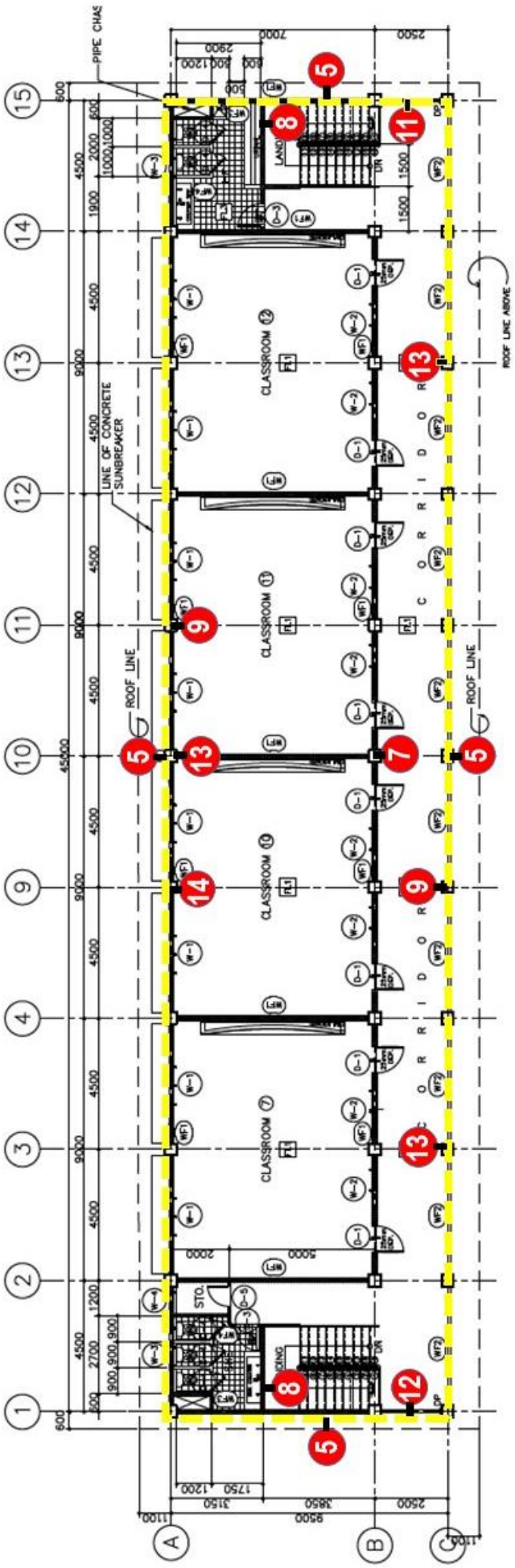
- Advised to be installed on area where welding works for steel roof framing are on-going

9 DANGER Safety harness required

- Advised to be installed atop roof beam during installation of trusses and purlins (2 Storey and up)

2 STOREY – 8 CLASSROOM

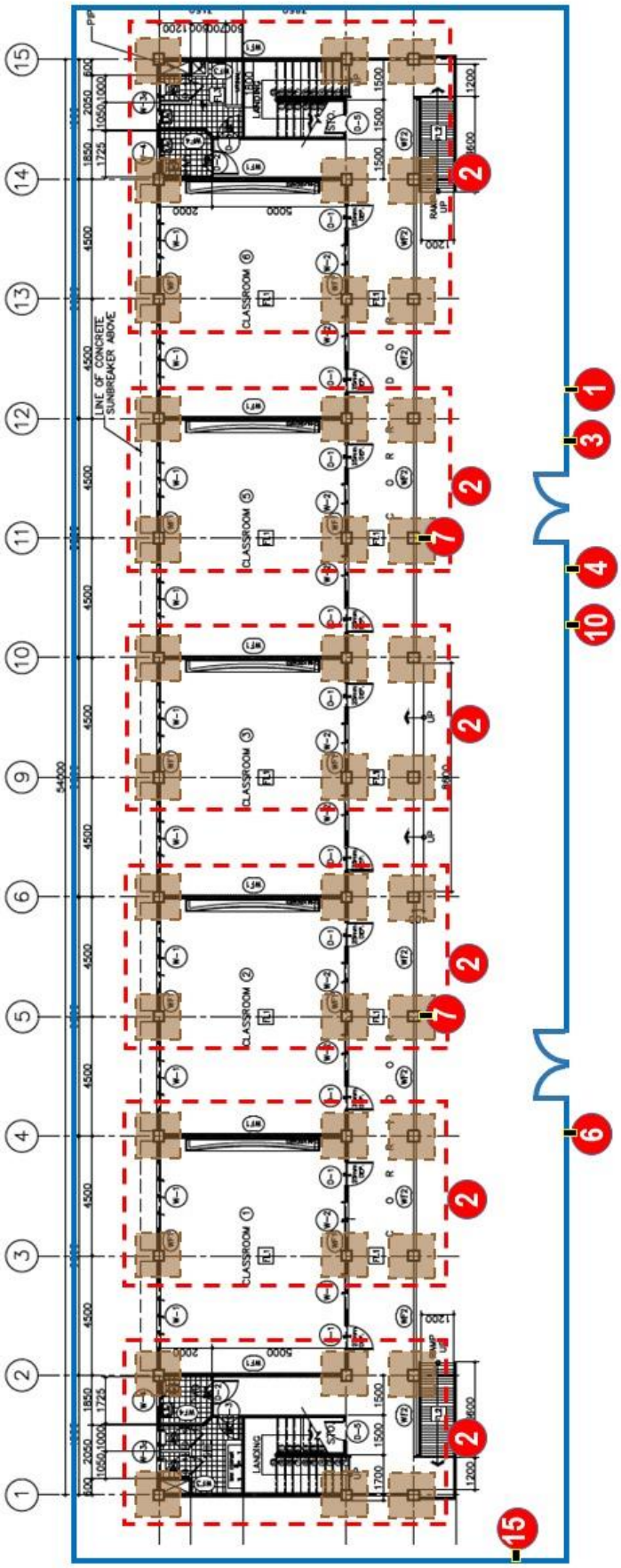

GROUND FLOOR PLAN
1c
2 Storey - 8 CL
CLASSROOM ①
CLASSROOM ②
CLASSROOM ⑤
CLASSROOM ⑥
LINE OF CONCRETE SUNBREAKER ABOVE
LANDING
RAMP UP
STO.
UP

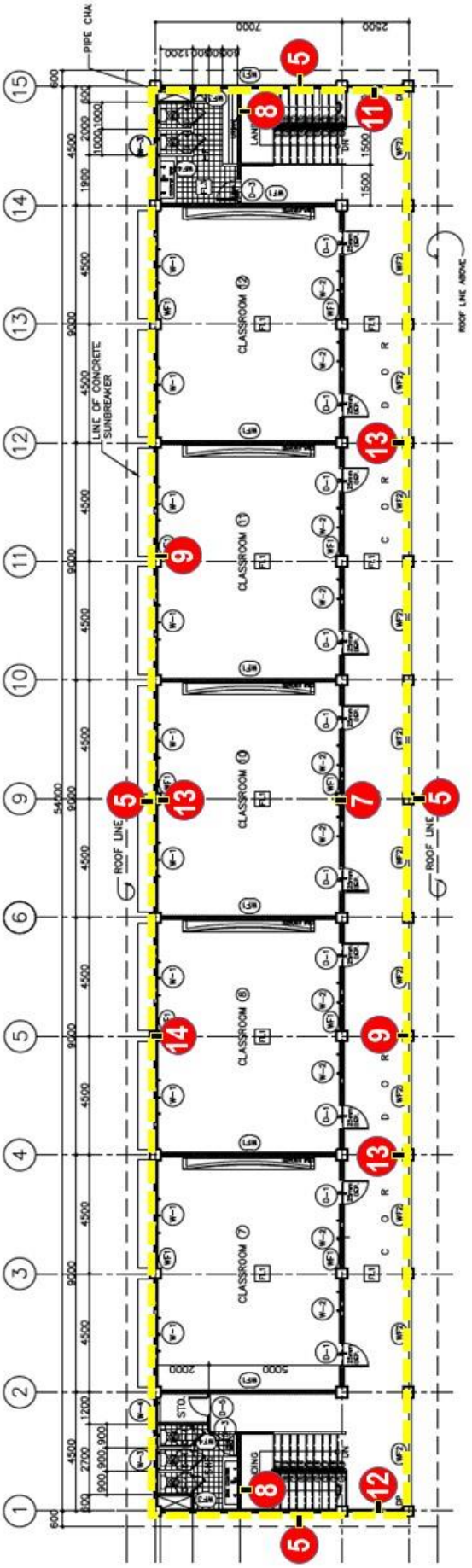


1d SECOND FLOOR PLAN

2 Storey - 8 CL

2 STOREY – 10 CLASSROOM

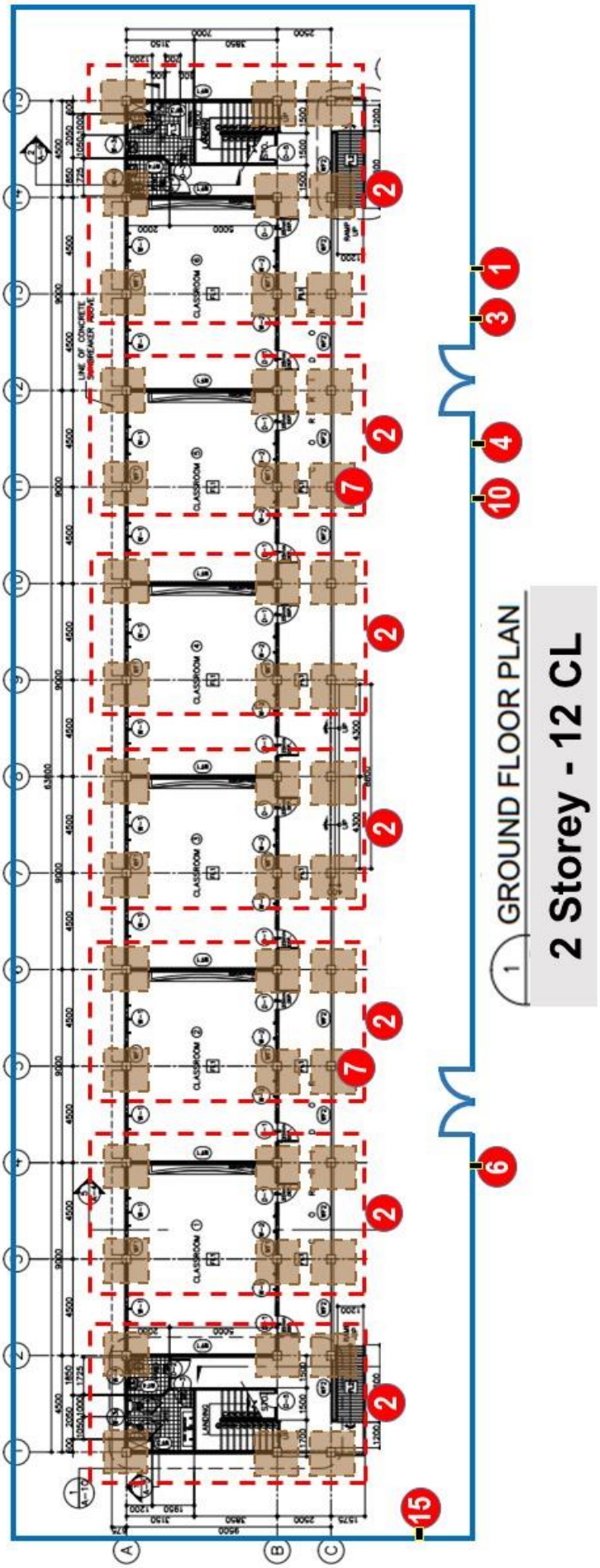

GROUND FLOOR PLAN
1a
2 Storey - 10 CL

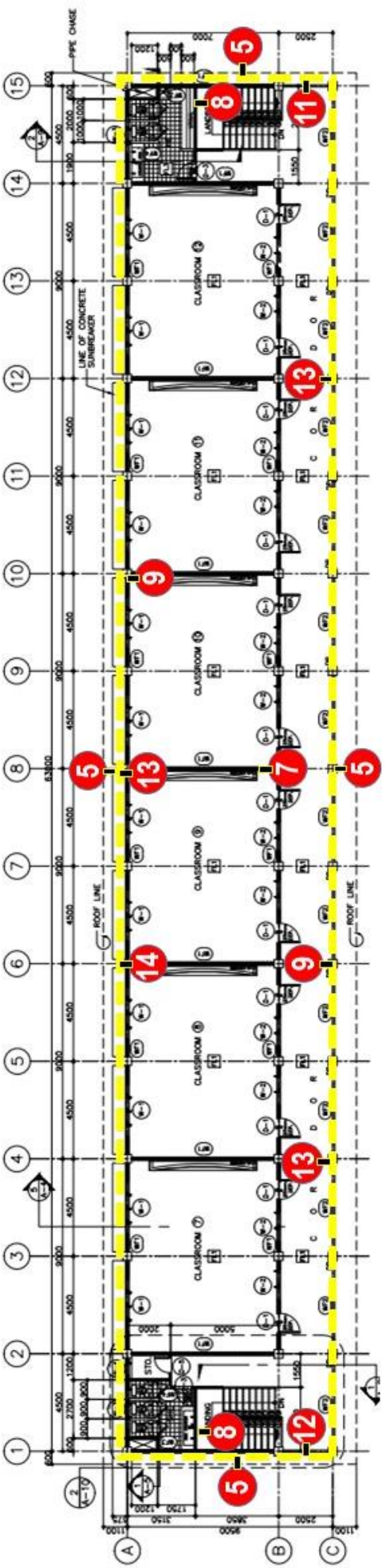


1b SECOND FLOOR PLAN

2 Storey - 10 CL

2 STOREY – 12 CLASSROOM

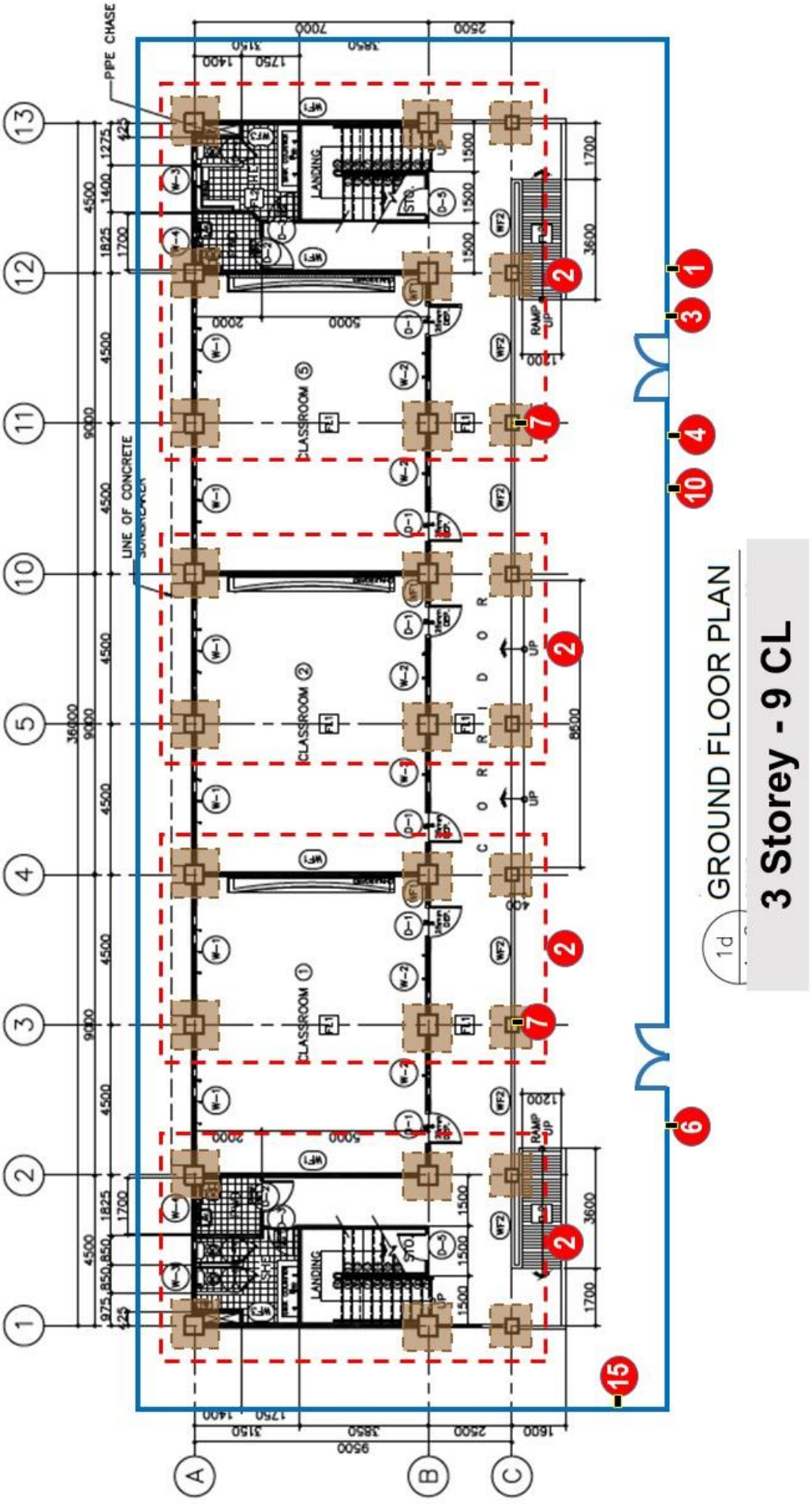

1
GROUND FLOOR PLAN
2 Storey - 12 CL

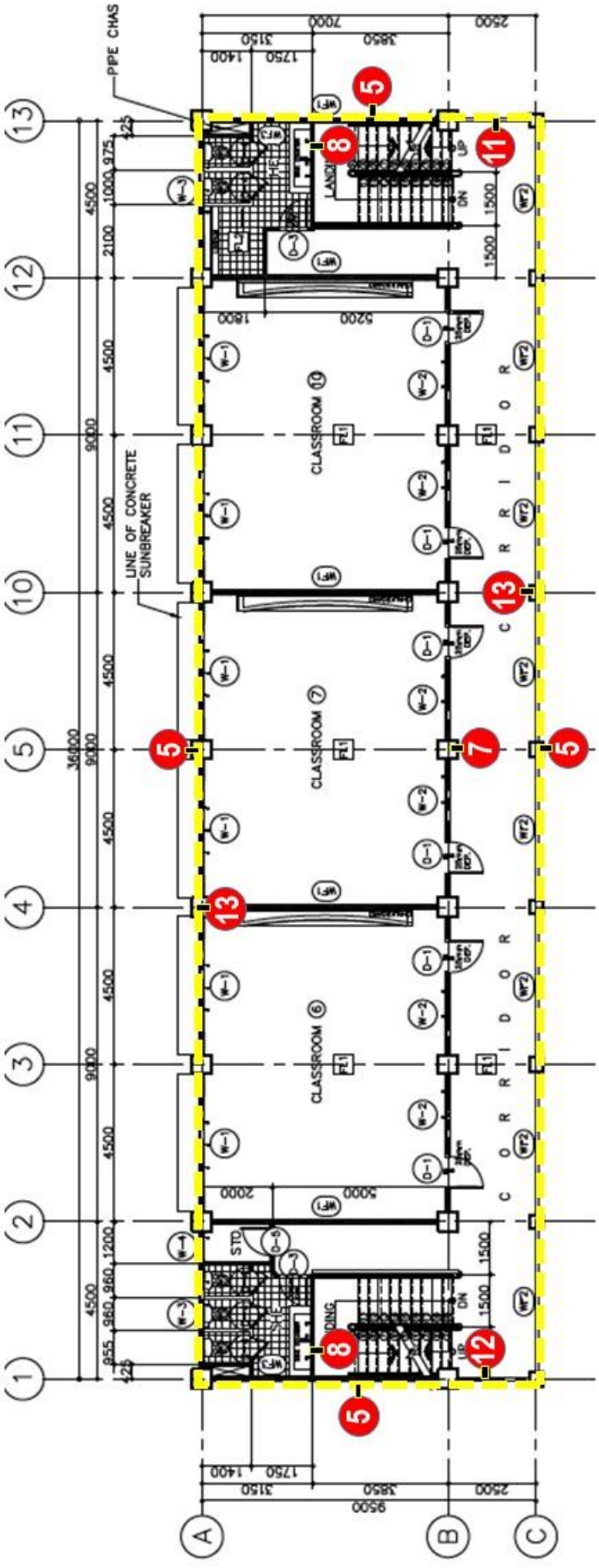


2 SECOND FLOOR PLAN

2 Storey - 12 CL

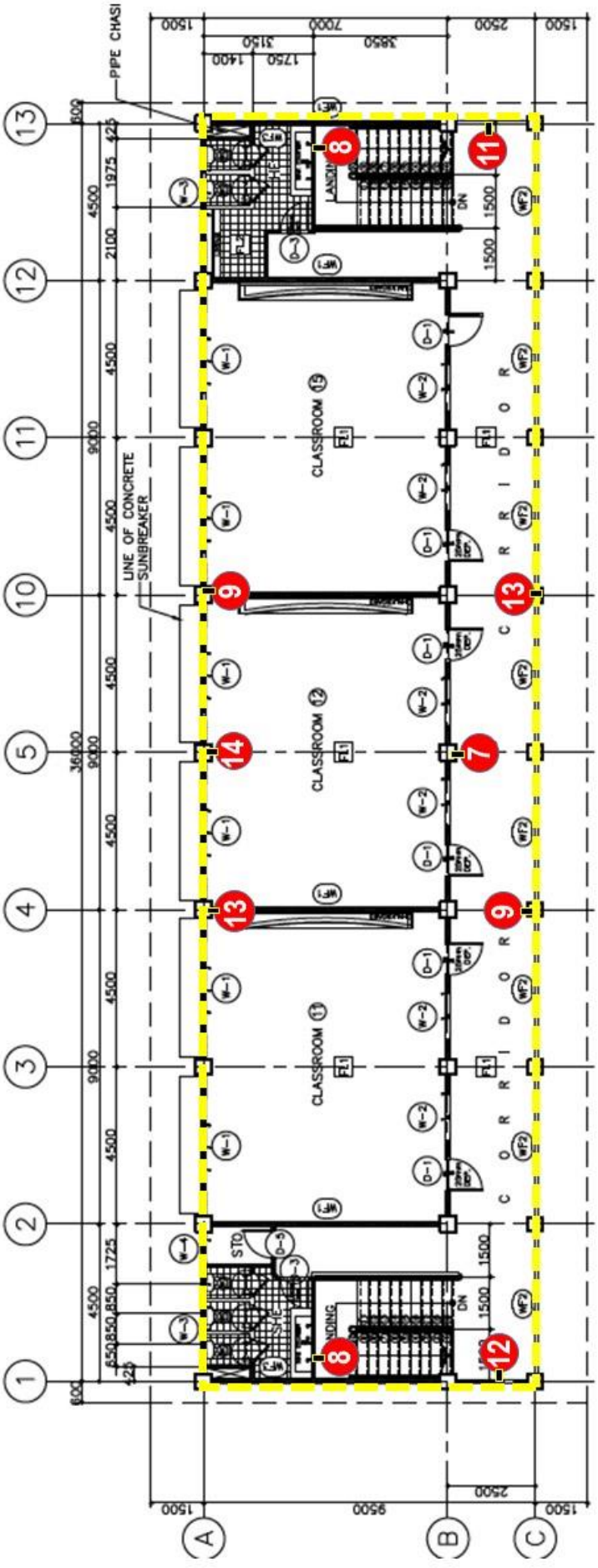
3 STOREY – 9 CLASSROOM


PIPE CHASE
LINE OF CONCRETE
CLASSROOM ①
CLASSROOM ②
CLASSROOM ⑤
LANDING
RAMP UP
CORRIDOR
GROUND FLOOR PLAN
3 Storey - 9 CL



1e SECOND FLOOR PLAN

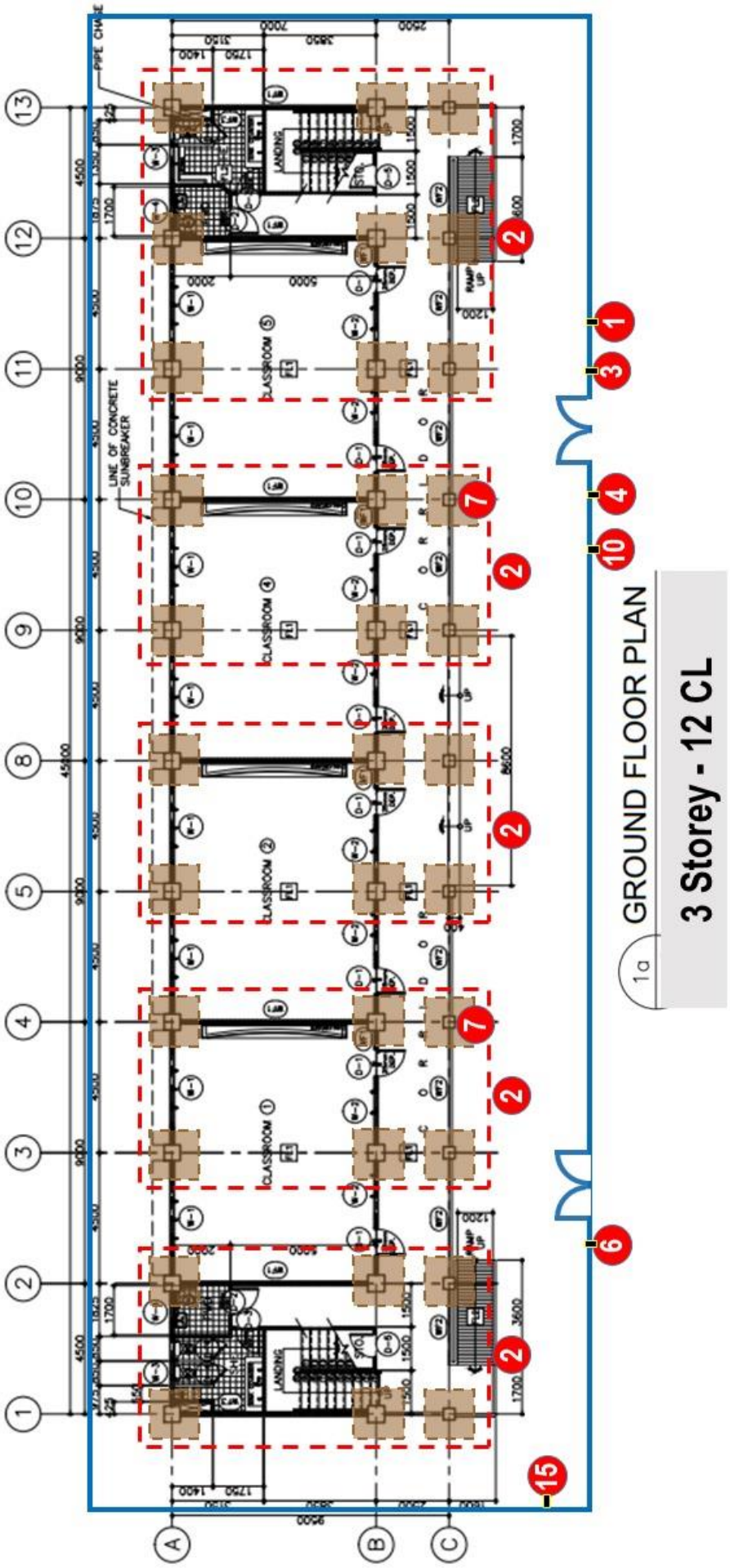
3 Storey - 9 CL

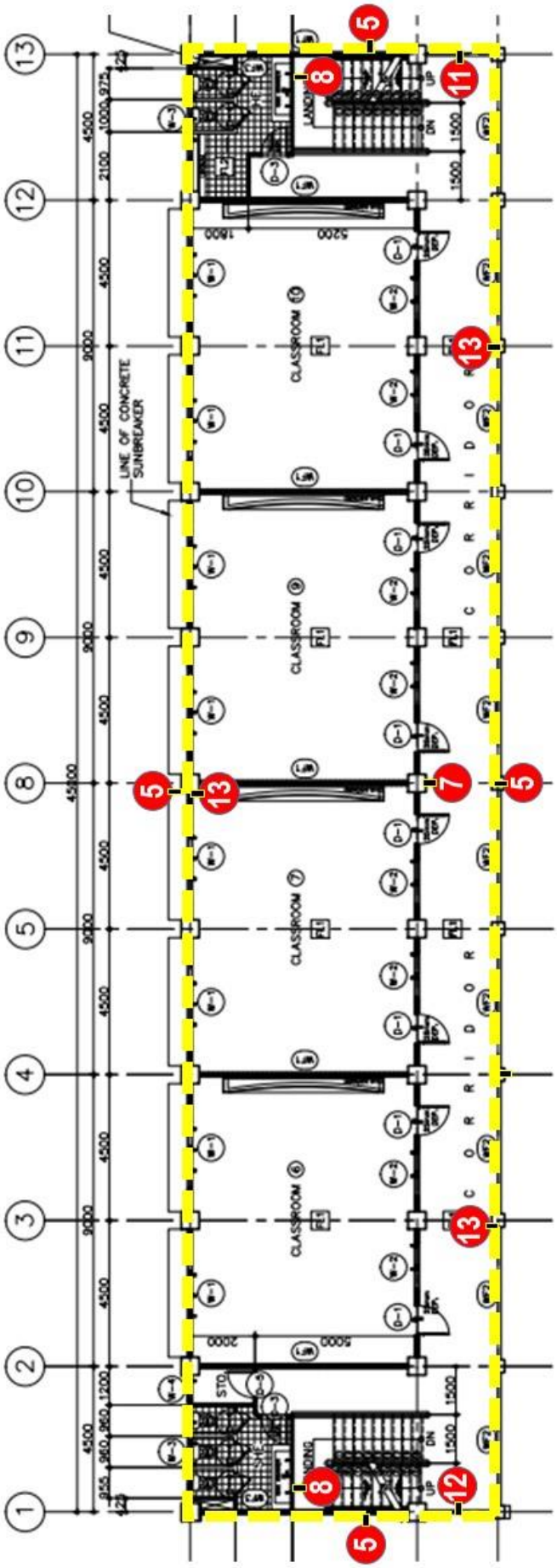


1f THIRD FLOOR PLAN

3 Storey - 9 CL

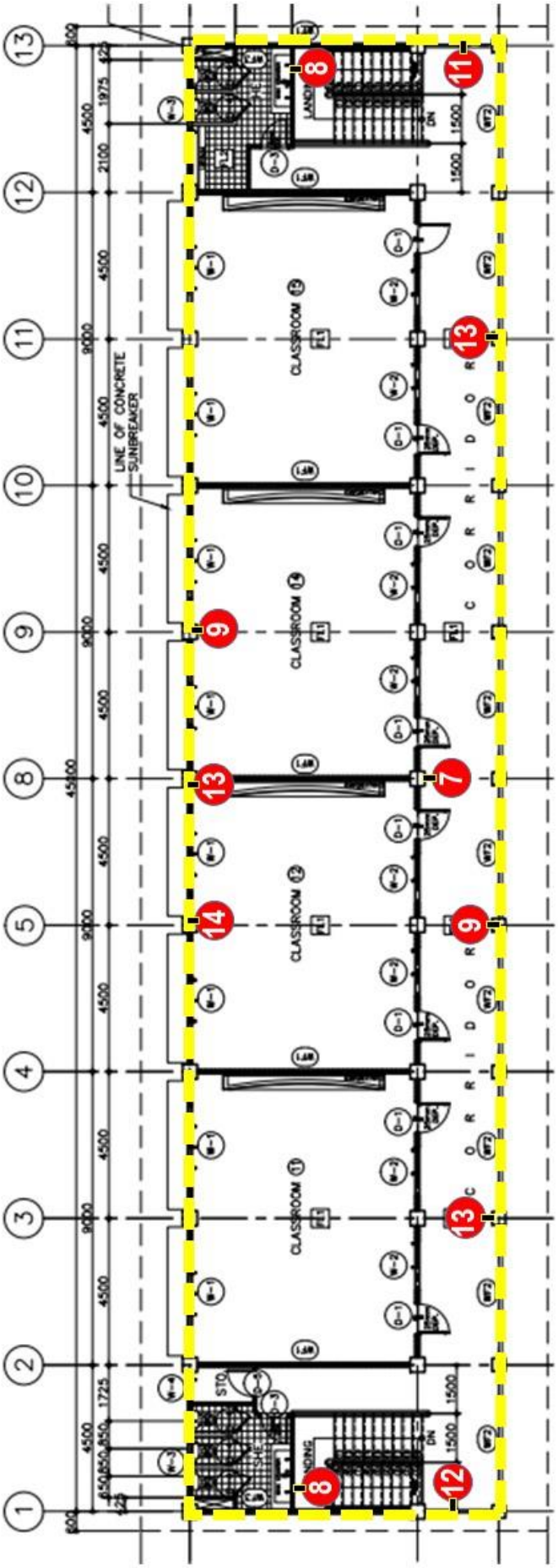
3 STOREY – 12 CLASSROOM


GROUND FLOOR PLAN
1a
3 Storey - 12 CL



1b SECOND FLOOR PLAN

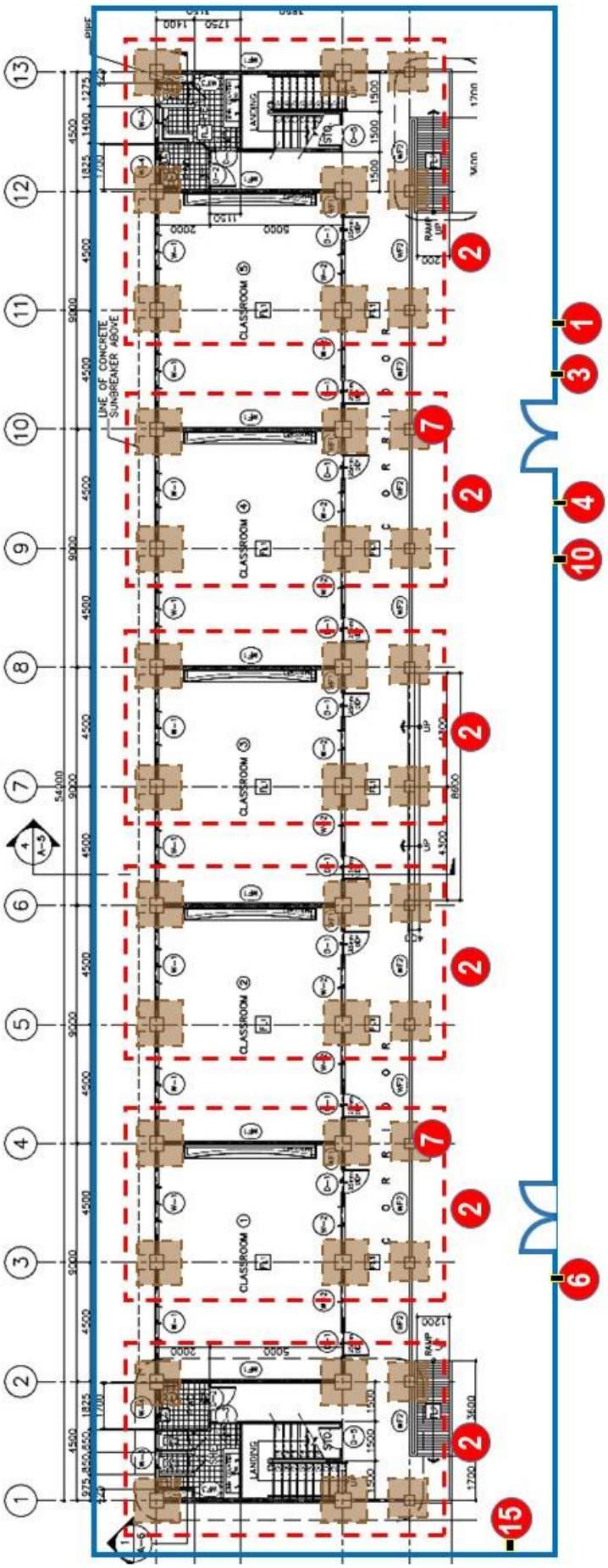
3 Storey - 12 CL



1c THIRD FLOOR PLAN

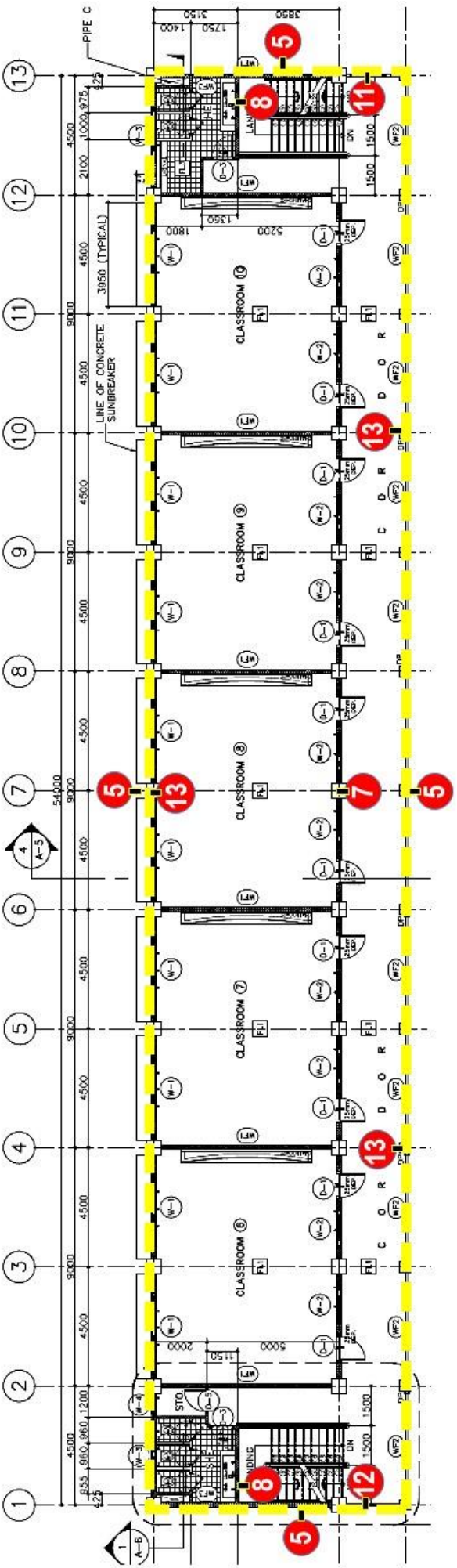
3 Storey - 12 CL

3 STOREY – 15 CLASSROOM



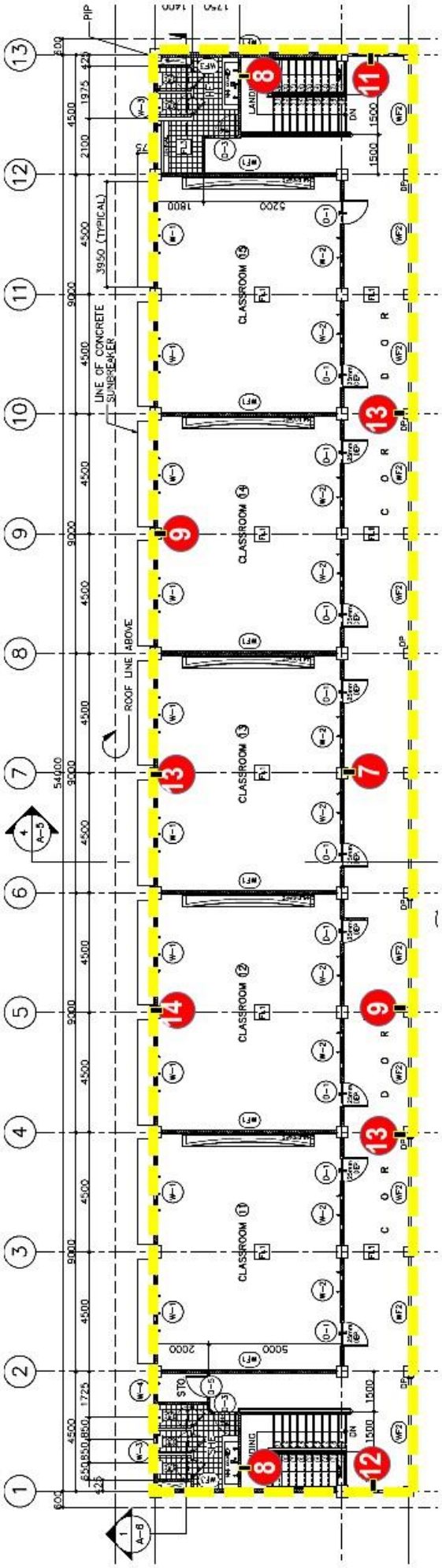
1 GROUND FLOOR PLAN

3 Storey - 15 CL



2 SECOND FLOOR PLAN

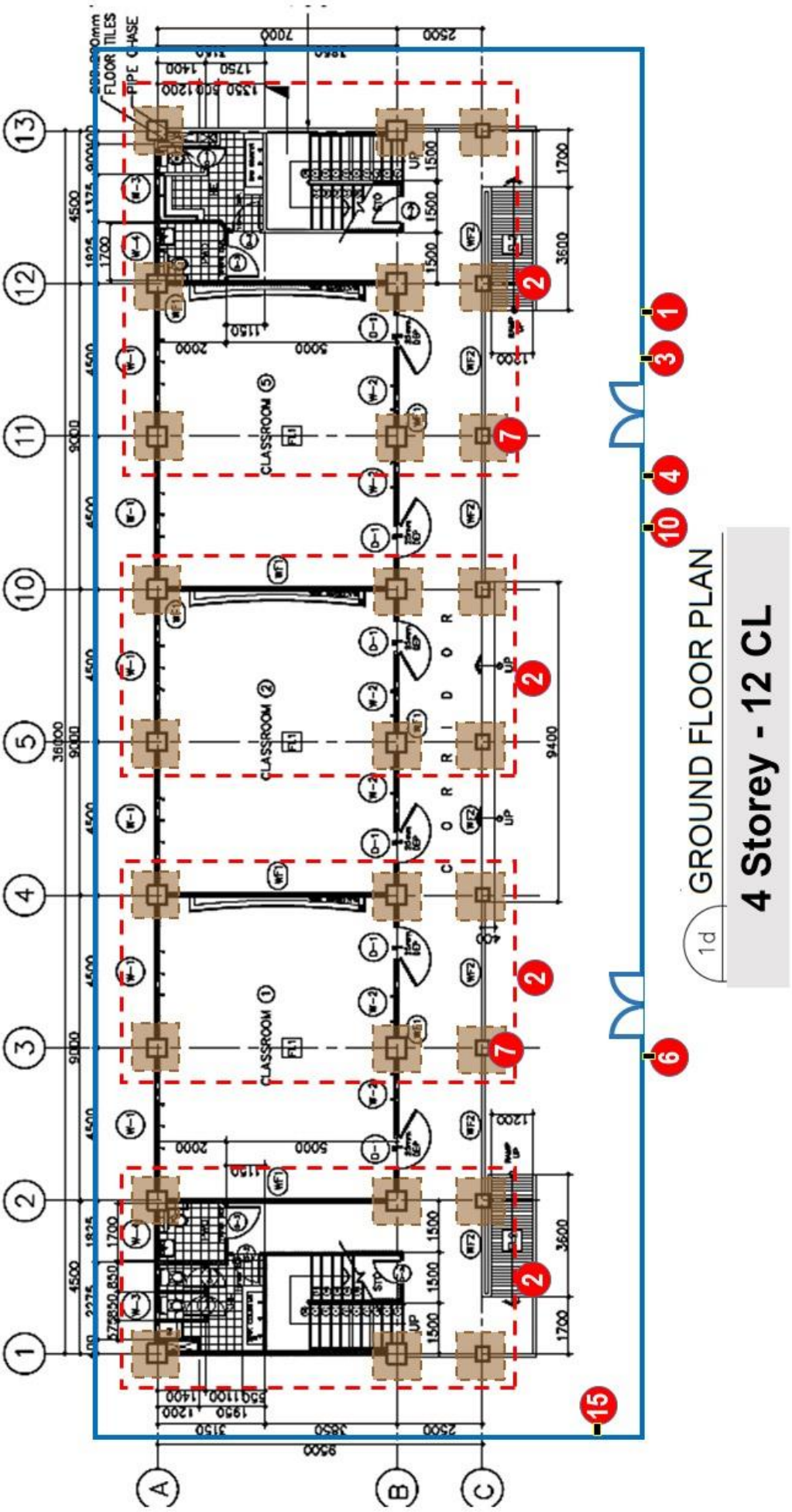
3 Storey - 15 CL

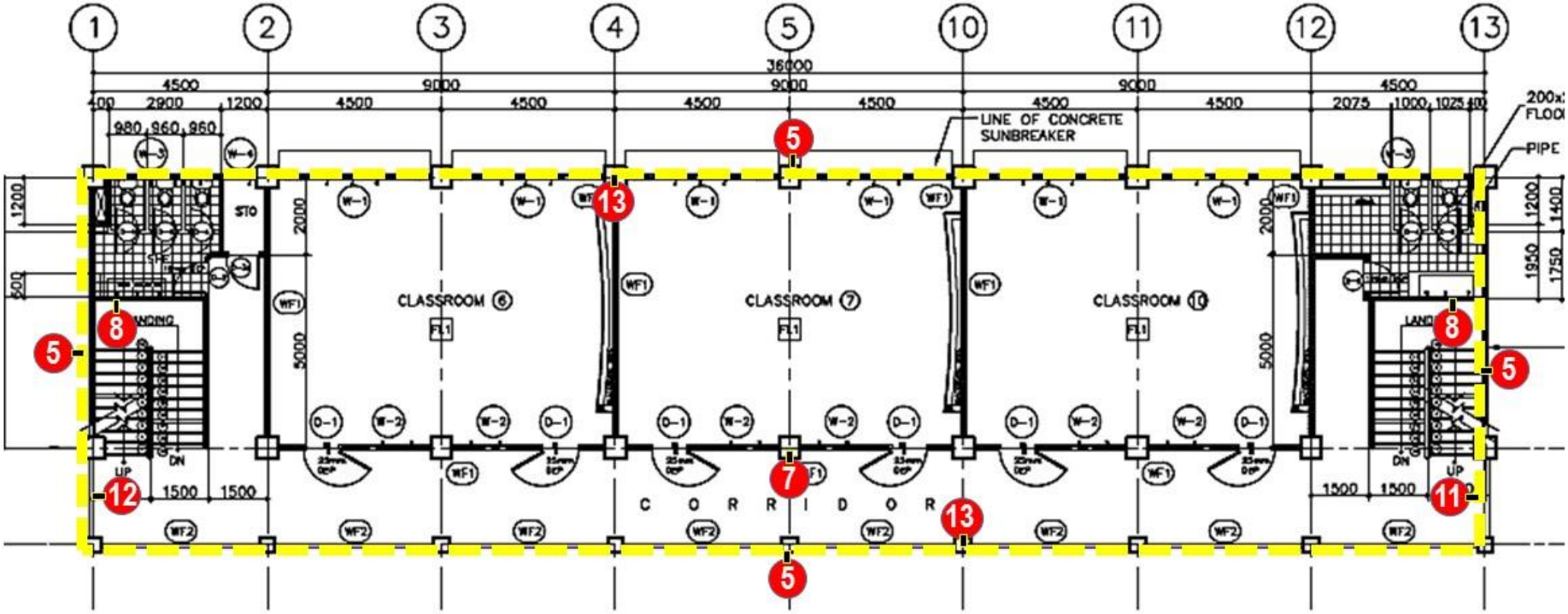


1 THIRD FLOOR PLAN

3 Storey - 15 CL

4 STOREY – 12 CLASSROOM


GROUND FLOOR PLAN
1d
4 Storey - 12 CL

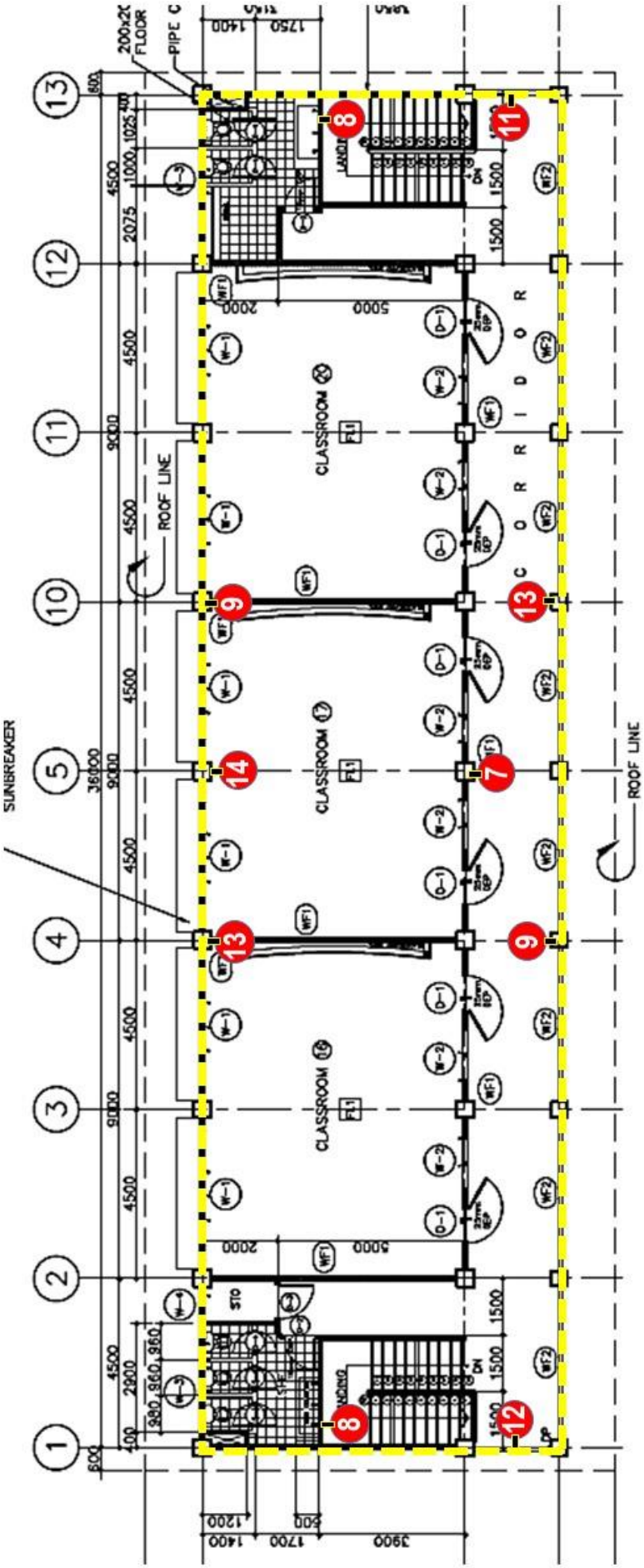


5 Beware Falling debris

- To be installed only along 2nd floor beam level (exterior side)

1e TYPICAL 2nd & 3rd FLOOR PLAN

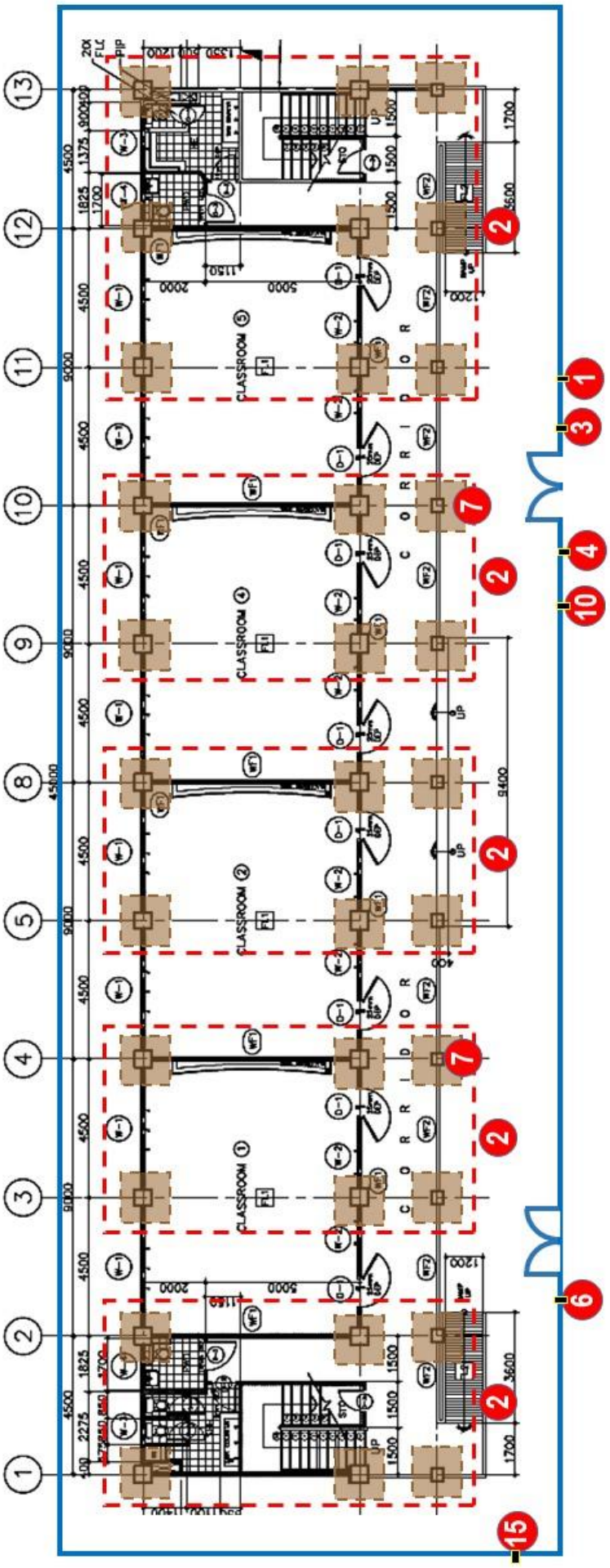
4 Storey - 12 CL

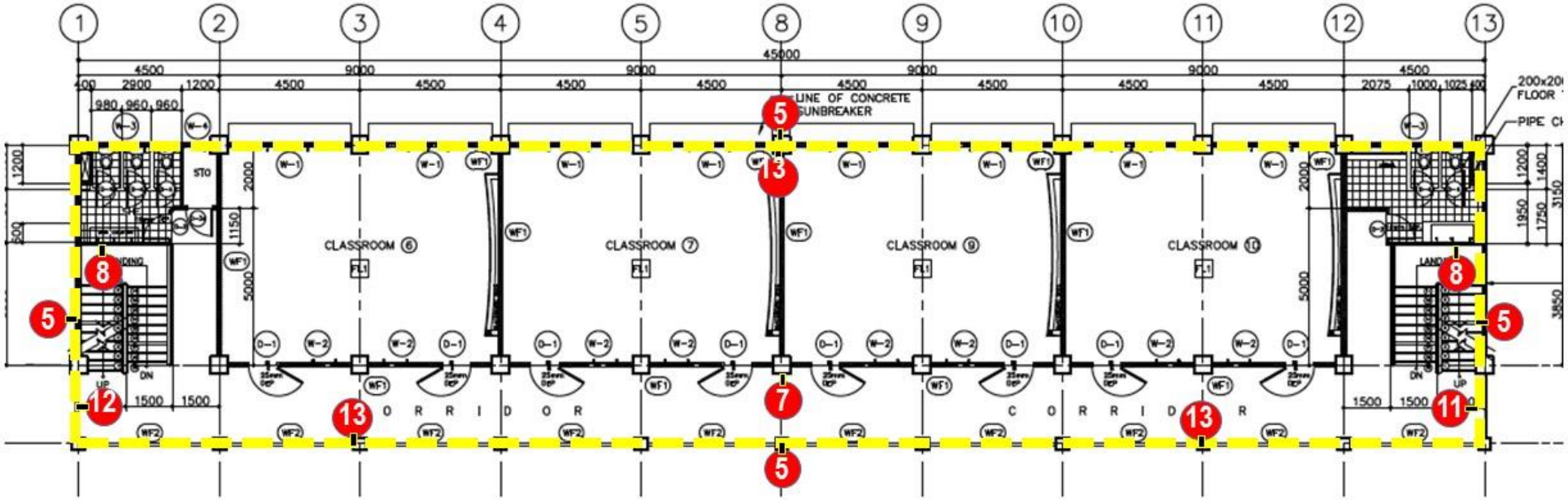


1f FOURTH FLOOR PLAN

4 Storey - 12 CL

4 STOREY – 16 CLASSROOM


CLASSROOM 5
CLASSROOM 4
CLASSROOM 2
CLASSROOM 1
CORRIDOR
UP
1a
GROUND FLOOR PLAN
4 Storey - 16 CL

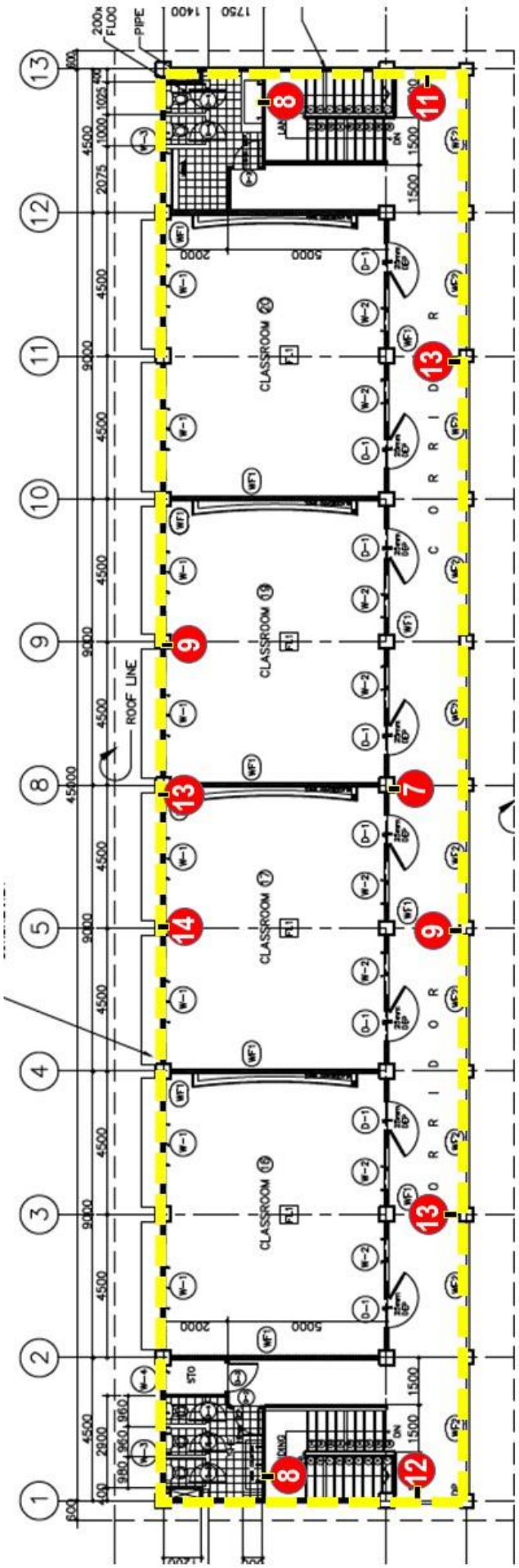


5 **Beware** Falling debris

- To be installed only along 2nd floor beam level (exterior side)

1b TYPICAL 2nd & 3rd FLOOR PLAN

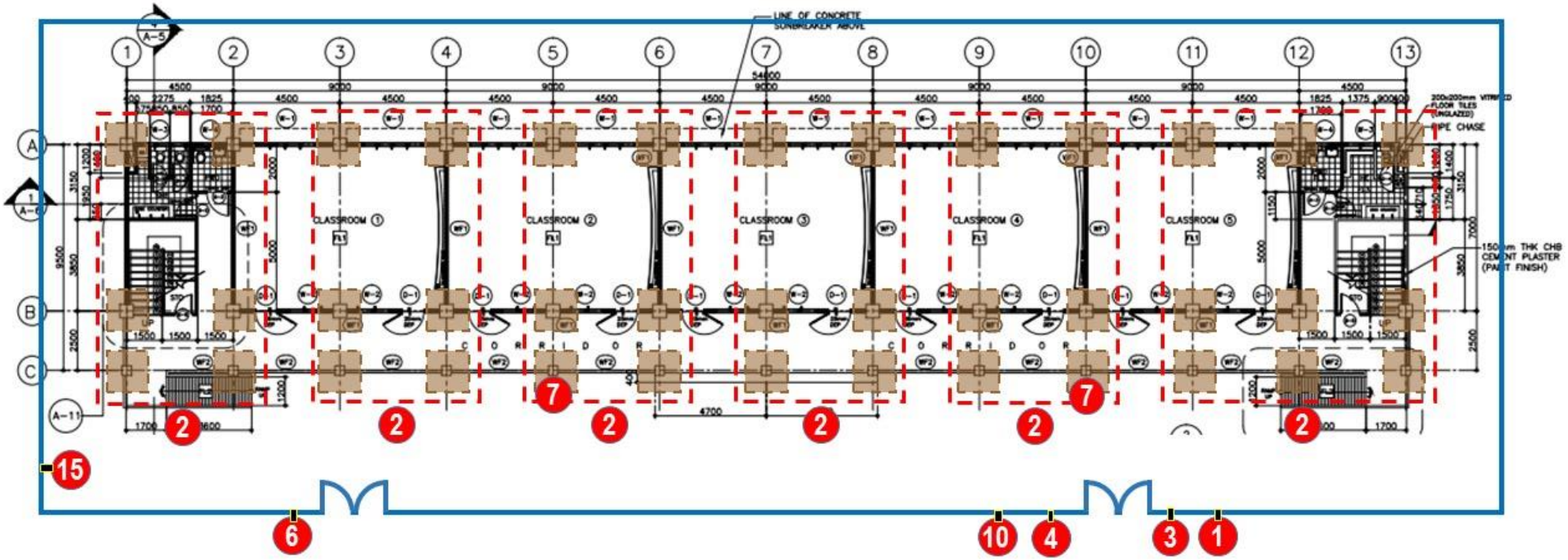
4 Storey - 16 CL



1c FOURTH FLOOR PLAN

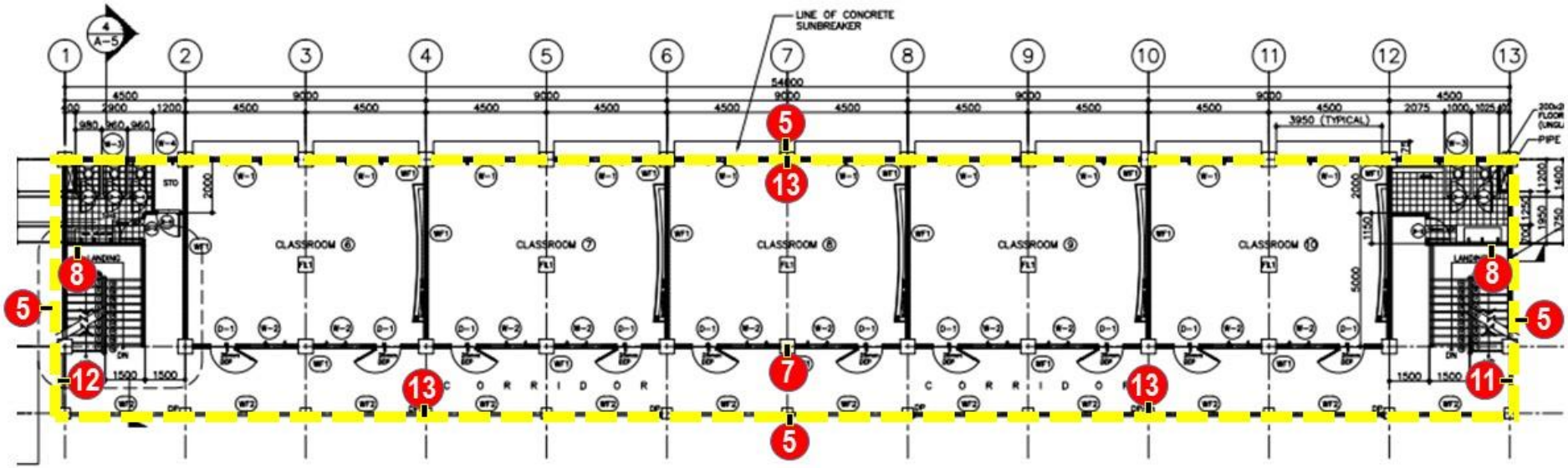
4 Storey - 16 CL

4 STOREY – 20 CLASSROOM



1 GROUND FLOOR PLAN

4 Storey - 20 CL

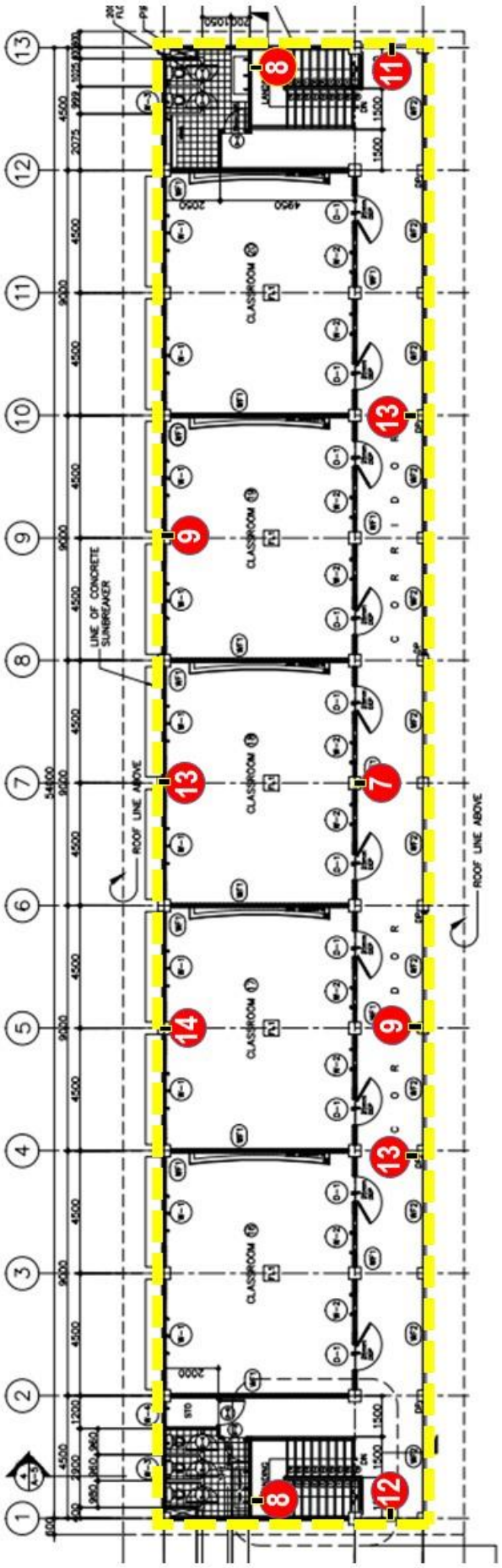


5 Beware Falling debris

- To be installed only along 2nd floor beam level (exterior side)

2 TYPICAL 2nd & 3rd FLOOR PLAN

4 Storey - 20 CL



1 FOURTH FLOOR PLAN

4 Storey - 20 CL

4.2.2 Checklist of Personal Protective Equipment (PPE)

SCOPE OF WORK			MANPOWER Designation	SAFETY HELMET	SAFETY SHOES	WORKING GLOVES	VEST	RAIN COATS	DUST MASK	EYE GOGGLES	EAR MOP	BODY HARNESS AND LANYARD	RUBBER BOOTS
IV.	**Earthworks**												
	Item 803	Excavation of Footing & Wall Footing	Foreman										
			Laborer	✓		✓	✓	✓					✓
	Item 804(a)	Backfilling of Excavated Materials	Foreman										
			Laborer	✓		✓	✓	✓					✓
	Item 804(b)	Gravel Bedding @ CF, WF, TG, SOF	Foreman										
			Laborer	✓		✓	✓	✓					✓
	Item 804(c)	Embankment	Foreman										
			Laborer	✓		✓	✓						✓
V.	**Termite Control Works**												
	Item 1000(a)	Soil Poisoning	Foreman										
			Laborer	✓		✓	✓		✓				✓
VI.	**Concrete Works**												
	Foundation to Ground Floor												
	Item 404	Rebars works (Col. Ftg., FTB, Columns)	Foreman										
			Steelman	✓	✓	✓	✓	✓					✓
			Laborer	✓	✓	✓	✓	✓					✓
		Formworks and Scaffolding (FTB, Columns)	Foreman										
			Carpenter	✓	✓	✓	✓	✓					✓
			Laborer	✓	✓	✓	✓	✓					✓
	Item 900	Concrete Works (Col. Ftg., FTB, Columns)	Foreman										
			Mason	✓	✓	✓	✓	✓					✓
			Laborer	✓	✓	✓	✓	✓					✓
	Second Floor												
	Item 404	Rebars works (Beams, Slabs, Column)	Foreman										
			Steelman	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					
		Formworks and Scaffolding	Foreman										
		(Beams, Slabs, Column)	Carpenter	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					
	Item 900	Concrete Works(Beams, Slabs, Column)	Foreman										
			Mason	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					
	Third Floor												
	Item 404	Rebars works (Beams, Slabs, Column)	Foreman										
			Steelman	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					

SCOPE OF WORK			MANPOWER Designation	SAFETY HELMET	SAFETY SHOES	WORKING GLOVES	VEST	RAIN COATS	DUST MASK	EYE GOGGLES	EAR MOP	BODY HARNESS AND LANYARD	RUBBER BOOTS
		Formworks and Scaffolding	Foreman										
		(Beams, Slabs, Column)	Carpenter	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					
	Item 900	Concrete Works(Beams, Slabs, Column)	Foreman										
			Mason	✓	✓	✓	✓	✓					
			Laborer	✓	✓	✓	✓	✓					
	Fourth Floor												
	Item 404	Rebars works (Beams, Slabs, Column)	Foreman										
			Steelman	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					
		Formworks and Scaffolding	Foreman										
		(Beams, Slabs, Column)	Carpenter	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					
	Item 900	Concrete Works(Beams, Slabs, Column)	Foreman										
			Mason	✓	✓	✓	✓	✓					
			Laborer	✓	✓	✓	✓	✓					
	Roof Beam												
	Item 404	Rebar Works	Foreman										
			Steelman	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					
		Formworks and Scaffolding	Foreman										
			Carpenter	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					
	Item 900	Concrete Works	Foreman										
			Mason	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					
VII.	**Masonry Works**												
	Item 506(1)A	Masonry Units (150mm Wall)	Foreman										
			Mason	✓	✓	✓	✓	✓					
			Laborer	✓	✓	✓	✓	✓					
	Item 506(1)B	Masonry Units (100mm Wall)	Foreman										
			Mason	✓	✓	✓	✓	✓					
			Laborer	✓	✓	✓	✓	✓					
VIII.	**Fabricated Materials and Hardwares**												
	Item 1006(a)	(0.90 x 2.40m) Mahogany Panel Door on 50x150mm THK. Mahogany Jamb with Fixed Clear Glass Transom (D-1)	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						

SCOPE OF WORK			MANPOWER Designation	SAFETY HELMET	SAFETY SHOES	WORKING GLOVES	VEST	RAIN COATS	DUST MASK	EYE GOGGLES	EAR MOP	BODY HARNESS AND LANYARD	RUBBER BOOTS
	Item 1006(b)	(0.90 x 2.10m) Hollow Core Flush Type Swing Door on 50x150mm THK. Mahogany Jamb with Marine Plywood Facing Inside and Ordinary Outside with SS Kicking Plate (D-2)	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1006(c)	(0.80 x 2.10m) Hollow Core Flush Type Swing Door on 50x150mm THK. Mahogany Jamb with Marine Plywood Facing Inside and Ordinary Outside (D-3)	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1006(d)	(0.60 x 1.20m) Swing door on 50x100mm Mahogany Door Jamb (D-4)	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1006 (f)	(0.80 x 2.10) Louver Door on 50x100 mm Mahogany Door Jamb (D-5)	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1010(a)	(2.50 x 1.50m) Jalousie Windows with Clear Glass Blades on Standard Jalouplus Casing and Fixed Clear Glass Transom on 50x150mm Mahogany Jamb Complete with Hardware and Accessories (W-1)	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1010(b)	(1.40 x 1.50m) Jalousie Windows with Clear Glass Blades on Standard Jalouplus Casing and Fixed Clear Glass Transom on 50x150mm Jamb Complete with Hardware and Accessories (W-2)	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1010(c)	(1.90 x 0.635m) Jalousie Windows with Clear Glass Blades on Standard Jalouplus Casing on 50x150mm Mahogany Jamb Complete with Hardware and Accessories (W-3)	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1010(d)	(0.60 x 0.635m) Jalousie Windows with Clear Glass Blades on Standard Jalouplus Casing on 50x150mm Mahogany Jamb Complete with Hardware and Accessories (W-4)	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1010(e)	Door Accessories (Locksets and Hinges)	Foreman										
			Carpenter										
			Laborer										
	Item SPL-4	Blackboard	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item SPL-6	Rail Guard	Foreman										
			Welder	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						

SCOPE OF WORK			MANPOWER Designation	SAFETY HELMET	SAFETY SHOES	WORKING GLOVES	VEST	RAIN COATS	DUST MASK	EYE GOGGLES	EAR MOP	BODY HARNESS AND LANYARD	RUBBER BOOTS
IX.	**Finishing Works**												
	Item 1021(c)	Plain Cement Finish with floor hardener non-skid	Foreman										
			Mason	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1021(c-2)	Non-skid Cement Floor Finish w/ 6mm groove lines	Foreman										
			Mason	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1027(a)	Plain Cement Plaster Finish	Foreman										
			Mason	✓	✓	✓	✓		✓			✓	
			Laborer	✓	✓	✓	✓		✓				
	Item 1018.2.1.1	200x200mm Vitrified Glazed Tiles Wall Finish	Foreman										
			Mason	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1018.2.1.2	200x200mm Vitrified Unglazed Tiles Floor Finish	Foreman										
			Mason	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
X.	**Carpentry Works**												
	Item 1003	Carpentry for Ceiling with Insulation	Foreman										
			Carpenter	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
XI.	**Roof and Framing Works**												
	Item 1013	Pre-Painted Metal Sheets (0.50 mm)	Foreman										
			Tinsmith	✓	✓	✓	✓					✓	
			Laborer	✓	✓	✓	✓						
	Item 403(a)	Steel Trusses and Lateral Struts	Foreman										
			Welder	✓	✓	✓	✓		✓	✓	✓	✓	
			Laborer	✓	✓	✓	✓						
	Item 403(b)	Purlins and Channel Beam	Foreman										
			Welder	✓	✓	✓	✓		✓	✓	✓	✓	
			Laborer	✓	✓	✓	✓						
	Item 403(b)	Purlins (Ceiling Support)	Foreman										
			Welder	✓	✓	✓	✓					✓	
			Laborer	✓	✓	✓	✓						
	Item 403(c)	Angular Base Plate	Foreman										
			Welder	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 404	Sag Rod	Foreman										
			Welder	✓	✓	✓	✓					✓	
			Laborer	✓	✓	✓	✓						

SCOPE OF WORK			MANPOWER Designation	SAFETY HELMET	SAFETY SHOES	WORKING GLOVES	VEST	RAIN COATS	DUST MASK	EYE GOGGLES	EAR MOP	BODY HARNESS AND LANYARD	RUBBER BOOTS
	Item 404	Cross Bracing	Foreman										
			Welder	✓	✓	✓	✓					✓	
			Laborer	✓	✓	✓	✓						
	SPL 905	Turn Buckle	Foreman										
			Welder	✓	✓	✓	✓					✓	
			Laborer	✓	✓	✓	✓						
XII.	**Painting Works**												
	Item 1032 (a-1)	Masonry Painting	Foreman										
			Painter	✓	✓	✓	✓		✓	✓		✓	
			Laborer	✓	✓	✓	✓		✓	✓			
	Item 1032 (a-2)	Wooden Painting	Foreman										
			Painter	✓	✓	✓	✓		✓				
			Laborer	✓	✓	✓	✓		✓				
	Item 1032 (a-3)	Metal Painting	Foreman										
			Painter	✓	✓	✓	✓		✓				
			Laborer	✓	✓	✓	✓		✓				
XIII.	**Electrical Works**												
	Item 1100	Conduits, Boxes and Fitting	Foreman										
			Electrician	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1101	Wires and Wiring Devices	Foreman										
			Electrician	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1102(a)	Lighting Fixtures	Foreman										
			Electrician	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1102(b)	Panel Board and Cabinets	Foreman										
			Electrician	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1102(c)	Fire Alarm System	Foreman										
			Electrician	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
XIV.	**Plumbing/ Sanitary Works**												
	Item 1001	Sewer Line Works	Foreman										
			Plumber	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item 1002.3.2	Cold Waterline Works	Foreman										
			Plumber	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						

SCOPE OF WORK			MANPOWER Designation	SAFETY HELMET	SAFETY SHOES	WORKING GLOVES	VEST	RAIN COATS	DUST MASK	EYE GOGGLES	EAR MOP	BODY HARNESS AND LANYARD	RUBBER BOOTS
	Item 1002.2.8	Downspout/ Storm Drainage	Foreman										
			Plumber	✓	✓	✓	✓	✓				✓	
			Laborer	✓	✓	✓	✓	✓					
	Item 1002.2.5	Sanitary Fixtures	Foreman										
			Plumber	✓	✓	✓	✓						
			Laborer	✓	✓	✓	✓						
	Item SPL-7	Septic Vault "Type E"	Foreman										
			Mason	✓	✓	✓	✓	✓					
			Laborer	✓	✓	✓	✓	✓					
	Item SPL-8	Catch Basin	Foreman										
			Mason	✓	✓	✓	✓	✓					
			Laborer	✓	✓	✓	✓	✓					

Cost Computation (Buildings)

C – 4.3

4.3.1 Cost of Signage and Barricades

DETAILED UNIT PRICE ANALYSIS (DUPA)

1 STOREY - 1 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				0.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				0.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	6.00	123.68	742.10
	d. Caution Tape , 1000 ft	roll	0.50	800.00	400.00
	Sub - Total for F				1,919.34
G.	Direct Unit Cost (E + F)				1,919.34
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

1 STOREY - 2 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				0.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				0.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	7.00	123.68	865.78
	d. Caution Tape , 1000 ft	roll	0.50	800.00	400.00
	Sub - Total for F				2,043.02
G.	Direct Unit Cost (E + F)				2,043.02
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

1 STOREY - 3 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				0.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				0.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	7.00	123.68	865.78
	d. Caution Tape , 1000 ft	roll	0.50	800.00	400.00
	Sub - Total for F				2,043.02
G.	Direct Unit Cost (E + F)				2,043.02
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

1 STOREY - 4 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				0.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				0.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	9.00	123.68	1,113.14
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	Sub - Total for F				2,690.38
G.	Direct Unit Cost (E + F)				2,690.38
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

1 STOREY - 5 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				0.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				0.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First Signage (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	9.00	123.68	1,113.14
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	Sub - Total for F				2,690.38
G.	Direct Unit Cost (E + F)				2,690.38
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 2 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	4	28.00	21.93	2,456.61
	b. GI pipe barricades 9.5 m x 1.2 m	2	28.00	49.59	2,776.93
	Sub - Total for B				5,233.54
C.	Total (A + B)				5,233.54
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				5,233.54
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	11.00	123.68	1,360.51
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	0.50	3,500.00	1,750.00
	Sub - Total for F				4,687.75
G.	Direct Unit Cost (E + F)				9,921.28
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 4 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	8	30.00	21.93	5,264.16
	b. GI pipe barricades 9.5 m x 1.2 m	2	30.00	49.59	2,975.28
	Sub - Total for B				8,239.44
C.	Total (A + B)				8,239.44
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				8,239.44
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	17.00	123.68	2,102.60
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	1.00	3,500.00	3,500.00
	Sub - Total for F				7,179.84
G.	Direct Unit Cost (E + F)				15,419.28
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 6 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	6	56.00	21.93	7,369.82
	b. GI pipe barricades 9.5 m x 1.2 m	2	56.00	49.59	5,553.86
	Sub - Total for B				12,923.68
C.	Total (A + B)				12,923.68
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				12,923.68
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	22.00	123.68	2,721.02
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	1.00	3,500.00	3,500.00
	Sub - Total for F				7,798.26
G.	Direct Unit Cost (E + F)				20,721.94
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 8 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	8	58.00	21.93	10,177.38
	b. GI pipe barricades 9.5 m x 1.2 m	2	58.00	49.59	5,752.21
	Sub - Total for B				15,929.58
C.	Total (A + B)				15,929.58
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				15,929.58
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	23.00	123.68	2,844.70
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	1.50	3,500.00	5,250.00
	Sub - Total for F				9,671.94
G.	Direct Unit Cost (E + F)				25,601.52
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 10 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	7	80.00	21.93	12,283.04
	b. GI pipe barricades 9.5 m x 1.2 m	2	80.00	49.59	7,934.08
	Sub - Total for B				20,217.12
C.	Total (A + B)				20,217.12
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				20,217.12
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	23.00	123.68	2,844.70
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	1.50	3,500.00	5,250.00
	Sub - Total for F				9,671.94
G.	Direct Unit Cost (E + F)				29,889.06
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 12 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	8	80.00	21.93	14,037.76
	b. GI pipe barricades 9.5 m x 1.2 m	2	80.00	49.59	7,934.08
	Sub - Total for B				21,971.84
C.	Total (A + B)				21,971.84
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				21,971.84
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	23.00	123.68	2,844.70
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	2.00	3,500.00	7,000.00
	Sub - Total for F				11,421.94
G.	Direct Unit Cost (E + F)				33,393.78
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

3 STOREY - 9 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	6	138.00	21.93	18,161.35
	b. GI pipe barricades 9.5 m x 1.2 m	2	138.00	49.59	13,686.29
	Sub - Total for B				31,847.64
C.	Total (A + B)				31,847.64
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				31,847.64
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	29.00	123.68	3,586.79
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	2.00	3,500.00	7,000.00
	Sub - Total for F				12,164.03
G.	Direct Unit Cost (E + F)				44,011.67
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

3 STOREY - 12 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	8	138.00	21.93	24,215.14
	b. GI pipe barricades 9.5 m x 1.2 m	2	138.00	49.59	13,686.29
	Sub - Total for B				37,901.42
C.	Total (A + B)				37,901.42
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				37,901.42
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	31.00	123.68	3,834.16
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	2.50	3,500.00	8,750.00
	Sub - Total for F				14,161.40
G.	Direct Unit Cost (E + F)				52,062.82
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

3 STOREY - 15 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	7	258.00	21.93	39,612.80
	b. GI pipe barricades 9.5 m x 1.2 m	2	258.00	49.59	25,587.41
	Sub - Total for B				65,200.21
C.	Total (A + B)				65,200.21
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				65,200.21
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	31.00	123.68	3,834.16
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	3.00	3,500.00	10,500.00
	Sub - Total for F				15,911.40
G.	Direct Unit Cost (E + F)				81,111.61
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

4 STOREY - 12 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	6	220.00	21.93	28,952.88
	b. GI pipe barricades 9.5 m x 1.2 m	2	220.00	49.59	21,818.72
	Sub - Total for B				50,771.60
C.	Total (A + B)				50,771.60
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				50,771.60
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	36.00	123.68	4,452.57
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	3.00	3,500.00	10,500.00
	Sub - Total for F				16,529.81
G.	Direct Unit Cost (E + F)				67,301.41
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

4 STOREY - 16 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	8	226.00	21.93	39,656.67
	b. GI pipe barricades 9.5 m x 1.2 m	2	226.00	49.59	22,413.78
	Sub - Total for B				62,070.45
C.	Total (A + B)				62,070.45
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				62,070.45
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	39.00	123.68	4,823.62
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	4.00	3,500.00	14,000.00
	Sub - Total for F				20,400.86
G.	Direct Unit Cost (E + F)				82,471.31
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

DETAILED UNIT PRICE ANALYSIS (DUPA)

4 STOREY - 20 CLASSROOM

Item No./Description : Construction Safety and Health (Signage and Baricades)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	No. of Days	Daily Rate	Amount
A.	Labor				
	Sub - Total for A				0.00
	Name and Capacity	**No of Units**	**No. of Days**	**Daily Rate**	**Amount**
B.	Equipment				
	a. GI pipe barricades 4.5 m x 1.2 m	7	327.00	21.93	50,206.93
	b. GI pipe barricades 9.5 m x 1.2 m	2	327.00	49.59	32,430.55
	Sub - Total for B				82,637.48
C.	Total (A + B)				82,637.48
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				82,637.48
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. PPE Signage (4' x 8')	set	1.00	506.37	506.37
	b. Safety First (4' x 4')	set	1.00	270.87	270.87
	c. Warning Signs (2' x 3')	sets	39.00	123.68	4,823.62
	d. Caution Tape , 1000 ft	roll	1.00	800.00	800.00
	e. Safety Net (1/8" x 2.7m x 90m)	roll	4.50	3,500.00	15,750.00
	Sub - Total for F				22,150.86
G.	Direct Unit Cost (E + F)				104,788.34
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	
J.	Value Added Tax (VAT)			5% of (G + H + I)	
K.	Total Unit Cost			(G + H + I + J)	

4.3.2 Cost of PPEs and Safety Personnel

DETAILED UNIT PRICE ANALYSIS (DUPA)

1 STOREY - 1 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 55 C.D.				
	a. Safety Practitioner/ Officer (Part Time)				
	b. Health Personnel (Full Time)	1	55 C.D.	280.00	15,400.00
	Sub - Total for A				15,400.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				15,400.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				15,400.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	472.00	0.25	118.00
	b. Safety Shoes	man-days	426.00	2.77	1,180.02
	c. Safety Gloves	man-days	472.00	7.67	3,620.24
	d. Vest	man-days	472.00	2.22	1,047.84
	e. Rain Coats	man-days	114.00	0.34	38.76
	f. Dust Mask	man-days	116.00	15.00	1,740.00
	g. Eye Goggles	man-days	62.00	2.82	174.84
	h. Ear Muff	man-days	26.00	0.83	21.58
	i. Body Harness and Lanyard	man-days	40.00	3.21	128.40
	j. Rubber Boots	man-days	103.00	1.39	143.17
	Sub - Total for F				8,212.85
G.	Direct Unit Cost (E + F)				23,612.85
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	1,889.03
J.	Value Added Tax (VAT)			5% of (G + H + I)	1,275.09
K.	Total Unit Cost			(G + H + I + J)	26,776.97

DETAILED UNIT PRICE ANALYSIS (DUPA)

1 STOREY - 2 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 80 C.D.				
	a. Safety Practitioner/ Officer (Part Time)				
	b. Health Personnel (Full Time)	1	80 C.D.	280.00	22,400.00
	Sub - Total for A				22,400.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				22,400.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				22,400.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	757.00	0.25	189.25
	b. Safety Shoes	man-days	678.00	2.77	1,878.06
	c. Safety Gloves	man-days	757.00	7.67	5,806.19
	d. Vest	man-days	757.00	2.22	1,680.54
	e. Rain Coats	man-days	189.00	0.34	64.26
	f. Dust Mask	man-days	162.00	15.00	2,430.00
	g. Eye Goggles	man-days	102.00	2.82	287.64
	h. Ear Muff	man-days	42.00	0.83	34.86
	i. Body Harness and Lanyard	man-days	67.00	3.21	215.07
	j. Rubber Boots	man-days	193.00	1.39	268.27
	Sub - Total for F				12,854.14
G.	Direct Unit Cost (E + F)				35,254.14
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	2,820.33
J.	Value Added Tax (VAT)			5% of (G + H + I)	1,903.72
K.	Total Unit Cost			(G + H + I + J)	39,978.19

DETAILED UNIT PRICE ANALYSIS (DUPA)

1 STOREY - 3 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 90 C.D.				
	a. Safety Practitioner/ Officer (Part Time)				
	b. Health Personnel (Full Time)	1	90 C.D.	280.00	25,200.00
	Sub - Total for A				25,200.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				25,200.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				25,200.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	1045.00	0.25	261.25
	b. Safety Shoes	man-days	933.00	2.77	2,584.41
	c. Safety Gloves	man-days	1045.00	7.67	8,015.15
	d. Vest	man-days	1045.00	2.22	2,319.90
	e. Rain Coats	man-days	243.00	0.34	82.62
	f. Dust Mask	man-days	216.00	15.00	3,240.00
	g. Eye Goggles	man-days	144.00	2.82	406.08
	h. Ear Muff	man-days	60.00	0.83	49.80
	i. Body Harness and Lanyard	man-days	94.00	3.21	301.74
	j. Rubber Boots	man-days	250.00	1.39	347.50
	Sub - Total for F				17,608.45
G.	Direct Unit Cost (E + F)				42,808.45
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	3,424.68
J.	Value Added Tax (VAT)			5% of (G + H + I)	2,311.66
K.	Total Unit Cost			(G + H + I + J)	48,544.78

DETAILED UNIT PRICE ANALYSIS (DUPA)

1 STOREY - 4 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 100 C.D.				
	a. Safety Practitioner/ Officer (Part Time)				
	b. Health Personnel (Full Time)	1	100 C.D.	280.00	28,000.00
	Sub - Total for A				28,000.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				28,000.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				28,000.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	1312.00	0.25	328.00
	b. Safety Shoes	man-days	1163.00	2.77	3,221.51
	c. Safety Gloves	man-days	1312.00	7.67	10,063.04
	d. Vest	man-days	1312.00	2.22	2,912.64
	e. Rain Coats	man-days	306.00	0.34	104.04
	f. Dust Mask	man-days	254.00	15.00	3,810.00
	g. Eye Goggles	man-days	178.00	2.82	501.96
	h. Ear Muff	man-days	76.00	0.83	63.08
	i. Body Harness and Lanyard	man-days	120.00	3.21	385.20
	j. Rubber Boots	man-days	335.00	1.39	465.65
	Sub - Total for F				21,855.12
G.	Direct Unit Cost (E + F)				49,855.12
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	3,988.41
J.	Value Added Tax (VAT)			5% of (G + H + I)	2,692.18
K.	Total Unit Cost			(G + H + I + J)	56,535.71

DETAILED UNIT PRICE ANALYSIS (DUPA)

1 STOREY - 5 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 115 C.D.				
	a. Safety Practitioner/ Officer (Part Time)				
	b. Health Personnel (Full Time)	1	115 C.D.	280.00	32,200.00
	Sub - Total for A				32,200.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				32,200.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				32,200.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	1557.00	0.25	389.25
	b. Safety Shoes	man-days	1384.00	2.77	3,833.68
	c. Safety Gloves	man-days	1557.00	7.67	11,942.19
	d. Vest	man-days	1557.00	2.22	3,456.54
	e. Rain Coats	man-days	360.00	0.34	122.40
	f. Dust Mask	man-days	302.00	15.00	4,530.00
	g. Eye Goggles	man-days	220.00	2.82	620.40
	h. Ear Muff	man-days	94.00	0.83	78.02
	i. Body Harness and Lanyard	man-days	145.00	3.21	465.45
	j. Rubber Boots	man-days	458.00	1.39	636.62
	Sub - Total for F				26,074.55
G.	Direct Unit Cost (E + F)				58,274.55
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	4,661.96
J.	Value Added Tax (VAT)			5% of (G + H + I)	3,146.83
K.	Total Unit Cost			(G + H + I + J)	66,083.34

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 2 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 110 C.D.				
	a. Safety Practitioner/ Officer (Part Time)				
	b. Health Personnel (Full Time)	1	110 C.D.	280.00	30,800.00
	Sub - Total for A				30,800.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				30,800.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				30,800.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	1629.00	0.25	407.25
	b. Safety Shoes	man-days	1576.00	2.77	4,365.52
	c. Safety Gloves	man-days	1629.00	7.67	12,494.43
	d. Vest	man-days	1629.00	2.22	3,616.38
	e. Rain Coats	man-days	661.00	0.34	224.74
	f. Dust Mask	man-days	396.00	15.00	5,940.00
	g. Eye Goggles	man-days	203.00	2.82	572.46
	h. Ear Muff	man-days	35.00	0.83	29.05
	i. Body Harness and Lanyard	man-days	368.00	3.21	1,181.28
	j. Rubber Boots	man-days	227.00	1.39	315.53
	Sub - Total for F				29,146.64
G.	Direct Unit Cost (E + F)				59,946.64
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	4,795.73
J.	Value Added Tax (VAT)			5% of (G + H + I)	3,237.12
K.	Total Unit Cost			(G + H + I + J)	67,979.49

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 4 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 115 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	9.00	500.00	4,500.00
	b. Health Personnel (Full Time)	1	115 C.D.	280.00	32,200.00
	Sub - Total for A				36,700.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				36,700.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				36,700.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	2224.00	0.25	556.00
	b. Safety Shoes	man-days	2135.00	2.77	5,913.95
	c. Safety Gloves	man-days	2224.00	7.67	17,058.08
	d. Vest	man-days	2224.00	2.22	4,937.28
	e. Rain Coats	man-days	849.00	0.34	288.66
	f. Dust Mask	man-days	570.00	15.00	8,550.00
	g. Eye Goggles	man-days	299.00	2.82	843.18
	h. Ear Muff	man-days	59.00	0.83	48.97
	i. Body Harness and Lanyard	man-days	506.00	3.21	1,624.26
	j. Rubber Boots	man-days	317.00	1.39	440.63
	Sub - Total for F				40,261.01
G.	Direct Unit Cost (E + F)				76,961.01
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	6,156.88
J.	Value Added Tax (VAT)			5% of (G + H + I)	4,155.89
K.	Total Unit Cost			(G + H + I + J)	87,273.79

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 6 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 135 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	10.00	500.00	5,000.00
	b. Health Personnel (Full Time)	1	135 C.D.	280.00	37,800.00
	Sub - Total for A				42,800.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				42,800.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				42,800.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	2958.00	0.25	739.50
	b. Safety Shoes	man-days	2826.00	2.77	7,828.02
	c. Safety Gloves	man-days	2958.00	7.67	22,687.86
	d. Vest	man-days	2958.00	2.22	6,566.76
	e. Rain Coats	man-days	1,174.00	0.34	399.16
	f. Dust Mask	man-days	745.00	15.00	11,175.00
	g. Eye Goggles	man-days	394.00	2.82	1,111.08
	h. Ear Muff	man-days	82.00	0.83	68.06
	i. Body Harness and Lanyard	man-days	655.00	3.21	2,102.55
	j. Rubber Boots	man-days	492.00	1.39	683.88
	Sub - Total for F				53,361.87
G.	Direct Unit Cost (E + F)				96,161.87
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	7,692.95
J.	Value Added Tax (VAT)			5% of (G + H + I)	5,192.74
K.	Total Unit Cost			(G + H + I + J)	109,047.56

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 8 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 145 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	11.00	500.00	5,500.00
	b. Health Personnel (Full Time)	1	145 C.D.	280.00	40,600.00
	Sub - Total for A				46,100.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				46,100.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				46,100.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	4041.00	0.25	1,010.25
	b. Safety Shoes	man-days	3842.00	2.77	10,642.34
	c. Safety Gloves	man-days	4041.00	7.67	30,994.47
	d. Vest	man-days	4041.00	2.22	8,971.02
	e. Rain Coats	man-days	1,558.00	0.34	529.72
	f. Dust Mask	man-days	1,061.00	15.00	15,915.00
	g. Eye Goggles	man-days	565.00	2.82	1,593.30
	h. Ear Muff	man-days	115.00	0.83	95.45
	i. Body Harness and Lanyard	man-days	836.00	3.21	2,683.56
	j. Rubber Boots	man-days	670.00	1.39	931.30
	Sub - Total for F				73,366.41
G.	Direct Unit Cost (E + F)				119,466.41
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	9,557.31
J.	Value Added Tax (VAT)			5% of (G + H + I)	6,451.19
K.	Total Unit Cost			(G + H + I + J)	135,474.91

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 10 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 170 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	13.00	500.00	6,500.00
	b. Health Personnel (Full Time)	1	170 C.D.	280.00	47,600.00
	Sub - Total for A				54,100.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				54,100.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				54,100.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	4733.00	0.25	1,183.25
	b. Safety Shoes	man-days	4498.00	2.77	12,459.46
	c. Safety Gloves	man-days	4733.00	7.67	36,302.11
	d. Vest	man-days	4733.00	2.22	10,507.26
	e. Rain Coats	man-days	1,832.00	0.34	622.88
	f. Dust Mask	man-days	1,228.00	15.00	18,420.00
	g. Eye Goggles	man-days	660.00	2.82	1,861.20
	h. Ear Muff	man-days	138.00	0.83	114.54
	i. Body Harness and Lanyard	man-days	988.00	3.21	3,171.48
	j. Rubber Boots	man-days	793.00	1.39	1,102.27
	Sub - Total for F				85,744.45
G.	Direct Unit Cost (E + F)				139,844.45
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	11,187.56
J.	Value Added Tax (VAT)			5% of (G + H + I)	7,551.60
K.	Total Unit Cost			(G + H + I + J)	158,583.61

DETAILED UNIT PRICE ANALYSIS (DUPA)

2 STOREY - 12 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 175 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	13.00	500.00	6,500.00
	b. Health Personnel (Full Time)	1	175 C.D.	280.00	49,000.00
	Sub - Total for A				55,500.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				55,500.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				55,500.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	5688.00	0.25	1,422.00
	b. Safety Shoes	man-days	5413.00	2.77	14,994.01
	c. Safety Gloves	man-days	5688.00	7.67	43,626.96
	d. Vest	man-days	5688.00	2.22	12,627.36
	e. Rain Coats	man-days	2,079.00	0.34	706.86
	f. Dust Mask	man-days	1,398.00	15.00	20,970.00
	g. Eye Goggles	man-days	754.00	2.82	2,126.28
	h. Ear Muff	man-days	160.00	0.83	132.80
	i. Body Harness and Lanyard	man-days	1,129.00	3.21	3,624.09
	j. Rubber Boots	man-days	914.00	1.39	1,270.46
	Sub - Total for F				101,500.82
G.	Direct Unit Cost (E + F)				157,000.82
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	12,560.07
J.	Value Added Tax (VAT)			5% of (G + H + I)	8,478.04
K.	Total Unit Cost			(G + H + I + J)	178,038.93

DETAILED UNIT PRICE ANALYSIS (DUPA)

3 STOREY - 3 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 115 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	9.00	500.00	4,500.00
	b. Health Personnel (Full Time)	1	115 C.D.	280.00	32,200.00
	Sub - Total for A				36,700.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				36,700.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				36,700.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	2433.00	0.25	608.25
	b. Safety Shoes	man-days	2374.00	2.77	6,575.98
	c. Safety Gloves	man-days	2433.00	7.67	18,661.11
	d. Vest	man-days	2433.00	2.22	5,401.26
	e. Rain Coats	man-days	1,183.00	0.34	402.22
	f. Dust Mask	man-days	470.00	15.00	7,050.00
	g. Eye Goggles	man-days	253.00	2.82	713.46
	h. Ear Muff	man-days	43.00	0.83	35.69
	i. Body Harness and Lanyard	man-days	511.00	3.21	1,640.31
	j. Rubber Boots	man-days	389.00	1.39	540.71
	Sub - Total for F				41,628.99
G.	Direct Unit Cost (E + F)				78,328.99
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	6,266.32
J.	Value Added Tax (VAT)			5% of (G + H + I)	4,229.77
K.	Total Unit Cost			(G + H + I + J)	88,825.07

DETAILED UNIT PRICE ANALYSIS (DUPA)

3 STOREY - 6 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 145 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	11.00	500.00	5,500.00
	b. Health Personnel (Full Time)	1	145 C.D.	280.00	40,600.00
	Sub - Total for A				46,100.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				46,100.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				46,100.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	3387.00	0.25	846.75
	b. Safety Shoes	man-days	3306.00	2.77	9,157.62
	c. Safety Gloves	man-days	3387.00	7.67	25,978.29
	d. Vest	man-days	3387.00	2.22	7,519.14
	e. Rain Coats	man-days	1,669.00	0.34	567.46
	f. Dust Mask	man-days	736.00	15.00	11,040.00
	g. Eye Goggles	man-days	374.00	2.82	1,054.68
	h. Ear Muff	man-days	62.00	0.83	51.46
	i. Body Harness and Lanyard	man-days	735.00	3.21	2,359.35
	j. Rubber Boots	man-days	576.00	1.39	800.64
	Sub - Total for F				59,375.39
G.	Direct Unit Cost (E + F)				105,475.39
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	8,438.03
J.	Value Added Tax (VAT)			5% of (G + H + I)	5,695.67
K.	Total Unit Cost			(G + H + I + J)	119,609.09

DETAILED UNIT PRICE ANALYSIS (DUPA)

3 STOREY - 9 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 175 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	13.00	500.00	6,500.00
	b. Health Personnel (Full Time)	1	175 C.D.	280.00	49,000.00
	Sub - Total for A				55,500.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				55,500.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				55,500.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	4,910.00	0.25	1,227.50
	b. Safety Shoes	man-days	4,782.00	2.77	13,246.14
	c. Safety Gloves	man-days	4,910.00	7.67	37,659.70
	d. Vest	man-days	4,910.00	2.22	10,900.20
	e. Rain Coats	man-days	2,493.00	0.34	847.62
	f. Dust Mask	man-days	1,032.00	15.00	15,480.00
	g. Eye Goggles	man-days	535.00	2.82	1,508.70
	h. Ear Muff	man-days	103.00	0.83	85.49
	i. Body Harness and Lanyard	man-days	950.00	3.21	3,049.50
	j. Rubber Boots	man-days	875.00	1.39	1,216.25
	Sub - Total for F				85,221.10
G.	Direct Unit Cost (E + F)				140,721.10
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	11,257.69
J.	Value Added Tax (VAT)			5% of (G + H + I)	7,598.94
K.	Total Unit Cost			(G + H + I + J)	159,577.73

DETAILED UNIT PRICE ANALYSIS (DUPA)

3 STOREY - 12 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 185 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	14.00	500.00	7,000.00
	b. Health Personnel (Full Time)	1	185 C.D.	280.00	51,800.00
	Sub - Total for A				58,800.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				58,800.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				58,800.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	5,881.00	0.25	1,470.25
	b. Safety Shoes	man-days	5,728.00	2.77	15,866.56
	c. Safety Gloves	man-days	5,881.00	7.67	45,107.27
	d. Vest	man-days	5,881.00	2.22	13,055.82
	e. Rain Coats	man-days	2,965.00	0.34	1,008.10
	f. Dust Mask	man-days	1,304.00	15.00	19,560.00
	g. Eye Goggles	man-days	654.00	2.82	1,844.28
	h. Ear Muff	man-days	120.00	0.83	99.60
	i. Body Harness and Lanyard	man-days	1,180.00	3.21	3,787.80
	j. Rubber Boots	man-days	1,041.00	1.39	1,446.99
	Sub - Total for F				103,246.67
G.	Direct Unit Cost (E + F)				162,046.67
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	12,963.73
J.	Value Added Tax (VAT)			5% of (G + H + I)	8,750.52
K.	Total Unit Cost			(G + H + I + J)	183,760.92

DETAILED UNIT PRICE ANALYSIS (DUPA)

3 STOREY - 15 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 200 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	15.00	500.00	7,500.00
	b. Health Personnel (Full Time)	1	200 C.D.	280.00	56,000.00
	Sub - Total for A				63,500.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				63,500.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				63,500.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	6885.00	0.25	1,721.25
	b. Safety Shoes	man-days	6701.00	2.77	18,561.77
	c. Safety Gloves	man-days	6885.00	7.67	52,807.95
	d. Vest	man-days	6885.00	2.22	15,284.70
	e. Rain Coats	man-days	3,484.00	0.34	1,184.56
	f. Dust Mask	man-days	1,571.00	15.00	23,565.00
	g. Eye Goggles	man-days	776.00	2.82	2,188.32
	h. Ear Muff	man-days	140.00	0.83	116.20
	i. Body Harness and Lanyard	man-days	1,416.00	3.21	4,545.36
	j. Rubber Boots	man-days	1,237.00	1.39	1,719.43
	Sub - Total for F				121,694.54
G.	Direct Unit Cost (E + F)				185,194.54
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	14,815.56
J.	Value Added Tax (VAT)			5% of (G + H + I)	10,000.51
K.	Total Unit Cost			(G + H + I + J)	210,010.61

DETAILED UNIT PRICE ANALYSIS (DUPA)

4 STOREY - 4 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 145 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	11.00	500.00	5,500.00
	b. Health Personnel (Full Time)	1	145 C.D.	280.00	40,600.00
	Sub - Total for A				46,100.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				46,100.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				46,100.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	2,977.00	0.25	744.25
	b. Safety Shoes	man-days	2,918.00	2.77	8,082.86
	c. Safety Gloves	man-days	2,977.00	7.67	22,833.59
	d. Vest	man-days	2,977.00	2.22	6,608.94
	e. Rain Coats	man-days	1,593.00	0.34	541.62
	f. Dust Mask	man-days	610.00	15.00	9,150.00
	g. Eye Goggles	man-days	311.00	2.82	877.02
	h. Ear Muff	man-days	41.00	0.83	34.03
	i. Body Harness and Lanyard	man-days	588.00	3.21	1,887.48
	j. Rubber Boots	man-days	503.00	1.39	699.17
	Sub - Total for F				51,458.96
G.	Direct Unit Cost (E + F)				97,558.96
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	7,804.72
J.	Value Added Tax (VAT)			5% of (G + H + I)	5,268.18
K.	Total Unit Cost			(G + H + I + J)	110,631.86

DETAILED UNIT PRICE ANALYSIS (DUPA)

4 STOREY - 8 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 175 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	13.00	500.00	6,500.00
	b. Health Personnel (Full Time)	1	175 C.D.	280.00	49,000.00
	Sub - Total for A				55,500.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				55,500.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				55,500.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	4265.00	0.25	1,066.25
	b. Safety Shoes	man-days	4178.00	2.77	11,573.06
	c. Safety Gloves	man-days	4265.00	7.67	32,712.55
	d. Vest	man-days	4265.00	2.22	9,468.30
	e. Rain Coats	man-days	2,288.00	0.34	777.92
	f. Dust Mask	man-days	969.00	15.00	14,535.00
	g. Eye Goggles	man-days	468.00	2.82	1,319.76
	h. Ear Muff	man-days	60.00	0.83	49.80
	i. Body Harness and Lanyard	man-days	901.00	3.21	2,892.21
	j. Rubber Boots	man-days	735.00	1.39	1,021.65
	Sub - Total for F				75,416.50
G.	Direct Unit Cost (E + F)				130,916.50
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	10,473.32
J.	Value Added Tax (VAT)			5% of (G + H + I)	7,069.49
K.	Total Unit Cost			(G + H + I + J)	148,459.31

DETAILED UNIT PRICE ANALYSIS (DUPA)

4 STOREY - 12 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 190 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	14.00	500.00	7,000.00
	b. Health Personnel (Full Time)	1	190 C.D.	280.00	53,200.00
	Sub - Total for A				60,200.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				60,200.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				60,200.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	6518.00	0.25	1,629.50
	b. Safety Shoes	man-days	6384.00	2.77	17,683.68
	c. Safety Gloves	man-days	6518.00	7.67	49,993.06
	d. Vest	man-days	6518.00	2.22	14,469.96
	e. Rain Coats	man-days	3,409.00	0.34	1,159.06
	f. Dust Mask	man-days	1,630.00	15.00	24,450.00
	g. Eye Goggles	man-days	819.00	2.82	2,309.58
	h. Ear Muff	man-days	99.00	0.83	82.17
	i. Body Harness and Lanyard	man-days	1,383.00	3.21	4,439.43
	j. Rubber Boots	man-days	1,112.00	1.39	1,545.68
	Sub - Total for F				117,762.12
G.	Direct Unit Cost (E + F)				177,962.12
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	14,236.97
J.	Value Added Tax (VAT)			5% of (G + H + I)	9,609.95
K.	Total Unit Cost			(G + H + I + J)	201,809.04

DETAILED UNIT PRICE ANALYSIS (DUPA)

4 STOREY - 16 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 205 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	15.00	500.00	7,500.00
	b. Health Personnel (Full Time)	1	205 C.D.	280.00	57,400.00
	Sub - Total for A				64,900.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				64,900.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				64,900.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	7828.00	0.25	1,957.00
	b. Safety Shoes	man-days	7663.00	2.77	21,226.51
	c. Safety Gloves	man-days	7828.00	7.67	60,040.76
	d. Vest	man-days	7828.00	2.22	17,378.16
	e. Rain Coats	man-days	4,113.00	0.34	1,398.42
	f. Dust Mask	man-days	1,993.00	15.00	29,895.00
	g. Eye Goggles	man-days	976.00	2.82	2,752.32
	h. Ear Muff	man-days	118.00	0.83	97.94
	i. Body Harness and Lanyard	man-days	1,708.00	3.21	5,482.68
	j. Rubber Boots	man-days	1,332.00	1.39	1,851.48
	Sub - Total for F				142,080.27
G.	Direct Unit Cost (E + F)				206,980.27
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	16,558.42
J.	Value Added Tax (VAT)			5% of (G + H + I)	11,176.93
K.	Total Unit Cost			(G + H + I + J)	234,715.63

DETAILED UNIT PRICE ANALYSIS (DUPA)

4 STOREY - 20 CLASSROOM

Item No./Description : Construction Safety and Health (PPE and Safety Personnel)
Unit of Measurement : lot
Output per hour : 1.000

	Designation	No. of Person	Man-days	Daily Rate	Amount
A.	Labor				
	Duration : 220 C.D.				
	a. Safety Practitioner/ Officer (Part Time)	1	16.00	500.00	8,000.00
	b. Health Personnel (Full Time)	1	220 C.D.	280.00	61,600.00
	Sub - Total for A				69,600.00
	Name and Capacity	**No of Units**	**No. of Hours**	**Hourly Rate**	**Amount**
B.	Equipment				
	Sub - Total for B				0.00
C.	Total (A + B)				69,600.00
D.	Output per Hour = 1 lot				
E.	Direct Unit Cost (C ÷ D)				69,600.00
	Name and Specification	**Unit**	**Quantity**	**Unit Cost**	**Amount**
F.	Materials				
	a. Safety Helmet	man-days	9147.00	0.25	2,286.75
	b. Safety Shoes	man-days	8951.00	2.77	24,794.27
	c. Safety Gloves	man-days	9147.00	7.67	70,157.49
	d. Vest	man-days	9147.00	2.22	20,306.34
	e. Rain Coats	man-days	4,779.00	0.34	1,624.86
	f. Dust Mask	man-days	2,359.00	15.00	35,385.00
	g. Eye Goggles	man-days	1,134.00	2.82	3,197.88
	h. Ear Muff	man-days	138.00	0.83	114.54
	i. Body Harness and Lanyard	man-days	2,021.00	3.21	6,487.41
	j. Rubber Boots	man-days	1,552.00	1.39	2,157.28
	Sub - Total for F				166,511.82
G.	Direct Unit Cost (E + F)				236,111.82
H.	Overhead, Contingencies & Miscellaneous (OCM)			of G	
I.	Contractor's Profit (CP)			8% of G	18,888.95
J.	Value Added Tax (VAT)			5% of (G + H + I)	12,750.04
K.	Total Unit Cost			(G + H + I + J)	267,750.80

Relative Cost of Construction Safety & Health to the Cost of Civil Works

C – 5

Table 6. Relative percentage of cost of Construction Safety & Health (CSH) to the cost of civil works (Roads)

Project Category / Level of Improvement			Percentage of Cost of Safety & Health to the Civil Works
Roads			
	1	Paved (Concrete) To Paved (Concrete)	0.30
	2	Paved (Asphalt) To Paved (Concrete)	0.20
	3	Paved (Asphalt) To Paved (Asphalt)	0.20
	4	Gravel To Asphalt	0.10
	5	Gravel To Concrete	0.20
	6	Asphalt Overlay	0.10
	7	Concrete Reblocking, 30% of existing PCCP	0.20
	8	Concrete Reblocking, 50% of existing PCCP	0.20
	9	Re-Gravelling	0.20
	10	New Road Opening, Concrete, Assume Embankment Height = 1.00m	0.20
	11	New Road Opening, Concrete , Assume Road Cut Height = 1.00m	0.30
	12	Widening Paved	0.30

Note: Derived percentage of cost of construction safety and health (as per project requirements) relative to civil works is advisably lower than the values above or within +10%.

Table 7. Relative percentage of cost of Construction Safety& Health (CSH) to the cost of civil works (Buildings)

TYPE OF SCHOOL BUILDING	**DIRECT COST (Civil & MEPF Works)**	SPL -1 - Personal Protective Equipment & Safety Personnel	SPL -2 - Signage & Barricades	Total Cost	Relative Percentage of Cost
ONE STOREY					
1-Classroom	750,336.17	23,612.85	1,919.34	25,532.19	3.40
2-Classroom	1,373,535.73	35,254.14	2,043.02	37,297.16	2.72
3-Classroom	1,997,229.48	42,808.45	2,043.02	44,851.47	2.25
4-Classroom	2,627,365.63	49,855.12	2,690.38	52,545.50	2.00
5-Classroom	3,203,236.16	58,274.55	2,690.38	60,964.93	1.90
TWO-STOREY					
2-Classroom	3,470,990.90	59,946.64	9,921.28	69,867.92	2.01
4-Classroom	5,024,465.55	76,961.01	15,419.28	92,380.29	1.84
6-Classroom	6,583,177.20	96,161.87	20,721.94	116,883.81	1.78
8-Classroom	9,196,213.52	119,466.41	25,601.52	145,067.93	1.58
10-Classroom	10,767,342.86	139,844.45	29,889.06	169,733.51	1.58
12-Classroom	12,350,759.24	157,000.82	33,393.78	190,394.60	1.54
THREE STOREY					
9-Classroom	12,348,200.63	140,721.10	44,011.67	184,732.77	1.50
12-Classroom	14,989,258.61	162,046.67	52,062.82	214,109.49	1.43
15-Classroom	17,587,460.90	185,194.54	81,111.61	266,306.15	1.51
FOUR-STOREY					
12-Classroom	16,206,764.28	177,962.12	67,301.41	245,263.53	1.51
16-Classroom	19,629,577.00	206,980.27	82,471.31	289,451.58	1.47
20-Classroom	22,971,845.00	236,111.82	104,788.34	340,900.16	1.48

Note: Derived percentage of cost of construction safety and health (as per project requirements) relative to civil works is advisably lower than the values above or within +10%.

Table 8. Relative Percentage of Cost of Construction Safety & Health (CSH) to the Cost of Civil Works (Bridge)

Bridge (Based on Typical Standard Design)

1.	**RCDG on R.C. Pile Foundation**	Length	15 l.m. @ 1 Span of 15 l.m.	63 l.m. @ 3 Spans of 21 l.m.	168 l.m. @ 7 Spans of 24 l.m.	312 l.m. @ 13 Spans of 24 l.m.	456 l.m. @ 19 Spans of 24 l.m.
	Reference/Given amount (Based on D.O. 44 : Calculation of Project Duration)	Amount	5,000,000.00	20,000,000.00	50,000,000.00	100,000,000.00	150,000,000.00
	Total estimated cost of Pay Item : Safety and Health		67,791.12	164,749.64	358,563.30	627,429.46	894,482.39
			Say 68,000.00	**Say 165,000.00**	**Say 359,000.00**	**Say 628,000.00**	**Say 895,000.00**
	Relative Weight (%)		1.36%	0.83%	0.72%	0.63%	0.60%
	Say		1.35	0.85	0.75	0.65	0.60
						Maximum =	**1.35**
2.	**PSCG on R.C. Pile Foundation**	Length	15 l.m. @ 1 Span of 15 l.m.	48 l.m. @ 2 Spans of 24 l.m.	120 l.m. @ 5 Spans of 24 l.m.	240 l.m. @ 10 Spans of 24 l.m.	360 l.m. @ 15 Spans of 24 l.m.
	Reference/Given amount (Based on D.O. 44 : Calculation of Project Duration)	Amount	5000000	20000000	50000000	100000000	150000000
	Total estimated cost of Pay Item : Safety and Health		69,167.56	113,958.62	201,854.33	346,298.56	493,585.48
			Say 70,000.00	**Say 114,000.00**	**Say 202,000.00**	**Say 347,000.00**	**Say 494,000.00**
	Relative Weight (%)		1.40%	0.57%	0.40%	0.35%	0.33%
	Say		1.40	0.60	0.40	0.35	0.35
						Maximum =	**1.40**
3.	**RCDG on Bored Pile Foundation**	Length	15 l.m. @ 1 Span of 15 l.m.	72 l.m. @ 3 Spans of 24 l.m.	168 l.m. @ 7 Spans of 24 l.m.	312 l.m. @ 13 Spans of 24 l.m.	456 l.m. @ 19 Spans of 24 l.m.
	Reference/Given amount (Based on D.O. 44 : Calculation of Project Duration)	Amount	5000000	20000000	50000000	100000000	150000000
	Total estimated cost of Pay Item : Safety and Health		62,719.95	151,745.94	295,303.50	519,149.10	741,305.67
			Say 63,000.00	**Say 152,000.00**	**Say 296,000.00**	**Say 520,000.00**	**Say 742,000.00**
	Relative Weight (%)		1.26%	0.76%	0.59%	0.52%	0.49%
	Say		1.25	0.75	0.60	0.55	0.50
						Maximum =	**1.25**
4.	**PSCG on Bored Pile Foundation**	Length	15 l.m. @ 1 Span of 15 l.m.	48 l.m. @ 2 Spans of 24 l.m.	120 l.m. @ 5 Spans of 24 l.m.	240 l.m. @ 10 Spans of 24 l.m.	360 l.m. @ 15 Spans of 24 l.m.
	Reference/Given amount (Based on D.O. 44 : Calculation of Project Duration)	Amount	5000000	20000000	50000000	100000000	150000000
	`		57,961.50	90,232.89	157,577.22	266,110.08	375,875.98
			Say 58,000.00	**Say 91,000.00**	**Say 158,000.00**	**Say 267,000.00**	**Say 376,000.00**
	Relative Weight (%)		1.16%	0.46%	0.32%	0.27%	0.25%
	Say		1.15	0.45	0.35	0.30	0.25
						Maximum =	**1.15**

Note: Derived percentage of cost of construction safety and health (as per project requirements) relative to civil works is advisably lower than the values above or within +10%.