

TEMPORARY WORKS DESIGN BRIEF

Inlet pipe trench support

Example Pump Station Upgrade, P1234

Excavation and trench support

BRIEF REFERENCE

TW 015

REVISION

A

STATUS

Issued 29 Sept 2026

CONSEQUENCE OF
FAILURE

CFR2

DESIGN COMPLEXITY

DCR2

EXECUTION RISK

ER2

CHECK CATEGORY

Cat 2

Revision record

Rev	Date	Description	Prepared	Reviewed
A	29 Sept 2026	Issued for design	J. Citizen	A. Sample

Signatures

Role	Name	Signature	Date
Prepared by (author)	J. Citizen, Site Engineer		
Reviewed by (Temporary Works Coordinator)	A. Sample		
Received by (designer)	Example Temporary Works Design, D. Example		

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This brief gives the designer the information, constraints and requirements for the design. It is not a design, and nothing in it is to be read as one. The author and the coordinator sign it at issue and the designer on receipt.

Prepared with TworkX from the brief data and a structured question set with a scope gap check (library EX01 version 2.11.0). At issue the check recorded 0 Stop, 0 Major and 5 Advisory items and 2 concept screening prompts.

Part 1. The brief

1 Brief at a glance

Table 1.1 Brief at a glance

Where each item is set out in full is given in brackets. Yellow cells are still to be completed.

The works	L1 Inlet pipe trench, chainage 0 to 45: 45 m long, 2.64 m wide, 3.8 m deep (RL 12.40 to RL 8.60); North and South: hydraulic or proprietary frame to a toe at RL 8.60; West end and East end: a batter at 45 degrees from horizontal
Where	Example Pump Station Upgrade, P1234; Western Australia; levels to AHD
Ground and groundwater	Fill, controlled and sand; groundwater RL 6.20, 2.4 m below the base
Design standard	WA Excavation code of practice
Governing loads and plant	Caterpillar 320 21.6 t 4 m back and Caterpillar 730 51.5 t 6 m back; 1 other surcharge; the lines at the angle of repose from 4 loads meet the excavation (Section 3)
Critical constraints	No mechanical excavation within 500 mm of a service and live services: DN150 Water main (Sections 3 and 4)
Consequence of failure	CFR2, potentially major impact, including injury, fatality or significant loss, but the failure would not set off a further chain of major incidents. Workers enter a 3.80 m deep trench, so collapse could injure or kill.
Design complexity	DCR2, more complex or involved designs where the consequence category is CFR2 or lower; also any simpler scheme where the consequence category is CFR2, or where it interacts with an adjacent but separately managed scheme. Catalogue frames within their rated depth, raised to DCR2 because the consequence category is CFR2.
Execution risk	ER2, conventional structures, where the consequence category is CFR2 or below. A conventional support structure.
Check category	2. An involved design that needs more than straightforward analysis, or one where the loads or the ground data need considerable interpretation.
Deliverables	Design sketches or drawings, design calculations, design report, design certificate, design check certificate, safety in design register, with the residual risks written on the drawings, construction methodology and sequence drawings, inspection and test plan with the hold points and the permit stages and 6 documentation items (lists, records and statements) (Section 6)
Open items	None
Design required on site by	01 Mar 2027
Designer and checker	Example Temporary Works Design, D. Example, 0400 000 002; checked by Design checker, Example Checking Engineers
Prepared by	J. Citizen, Site Engineer, 0400 000 000 (author); A. Sample (Temporary Works Coordinator); engaged by the contractor; issued by Example Constructions
Drawings	12 A3 sheets, TW 015-SK-01 to SK-12, in Part 2

2 Scope and description of the works

This brief sets out the information, constraints and requirements for the geotechnical assessment of the excavation described below and the design of the temporary support it requires. It is issued to the nominated designer as the basis of the design.

The designer is to confirm receipt, review the brief for completeness and raise any query in writing before commencing design; what the designer is to return is in Section 9.

2.1 Scope of the design

Example Constructions requires the geotechnical assessment of the excavation below, for the construction of the permanent works: DN900 steel pipe on granular bedding. The assessment and the design of the temporary support it requires are to cover every stage of the sequence in Section 5, from installation through staged excavation, backfill and removal of the support, for the ground, water, loads and neighbours described in Sections 2 and 3.

- L1 Inlet pipe trench, chainage 0 to 45, 3.8 m deep. Proposed by the author: North and South: hydraulic or proprietary frame to a toe at RL 8.60; West end and East end: a batter at 45 degrees from horizontal.

The design includes:

- The shoring on each side with its propping, waling, anchorage or bracing at every stage, and its toe and embedment.
- The stability of the batters and benches.
- Allowance for the plant and surcharges at the positions in Section 3, and for the adjacent structures and services described there.
- The temporary support or protection of services, designed by Temporary works designer, as part of this brief.

Table 2.1 Parts of the scheme and who designs them

No single checker of the whole scheme is named.

Part	Designed by
Whole scheme	Temporary works designer

The design is to the standards and requirements in Sections 4 and 6. Design life: 6 weeks open; nothing left in place. The approved design is required on site by 01 Mar 2027.

2.2 Legislation

The works are in Western Australia. The brief cites the Work Health and Safety Act 2020 (WA) and Work Health and Safety (General) Regulations 2022 (WA), the WA Excavation code of practice and, for noise, the Environmental Protection (Noise) Regulations 1997 (WA). Documents are cited by reference. The designer uses the current edition of each unless the project specification names another.

Calculation basis: limit state design to the standards listed (AS 4678, AS 4100, AS/NZS 1170 series), unless the project specification states otherwise.

2.3 The works

Each excavation is described below from the data; the method proposed for each is in Section 2.1, the ground, the groundwater and every value in Section 3, and the sequence in Section 5.

L1 Inlet pipe trench, chainage 0 to 45 is an excavation for a pipe or service trench, 45 m long and 2.64 m wide at the base, from the existing surface at RL 12.40 to a base at RL 8.60 (3.8 m deep at its deepest). Beside it: Valve chamber 6 m from the South side and the live DN150 Water main crossing it. 3 loads work beside it, and the lines at the angle of repose from 4 of them meet the excavation.

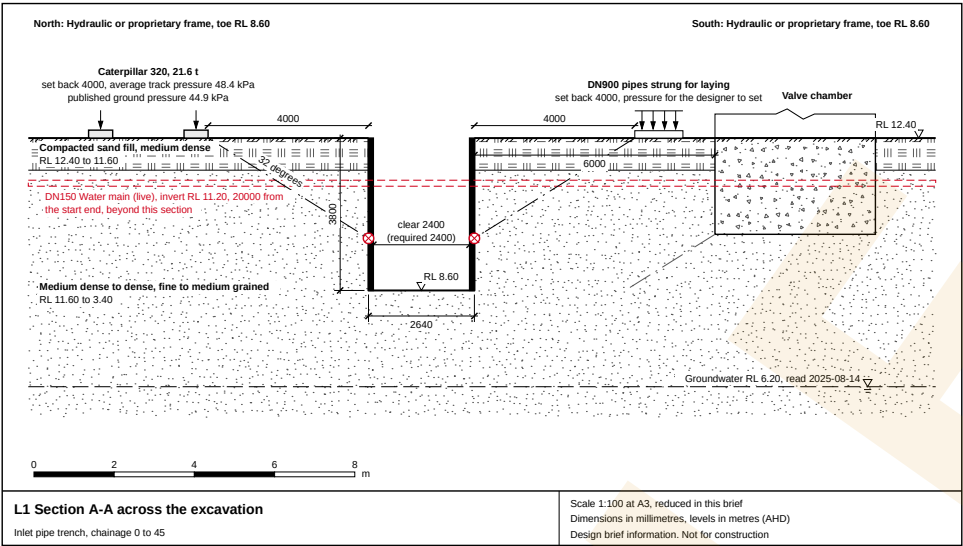


Figure 2.1 L1 Inlet pipe trench, chainage 0 to 45. Section A-A across the excavation. Sketch for context, not to scale as printed; drawn to scale on TW 015-SK-02 in Part 2.

2.4 Reference drawings and documents

Table 2.2 Reference drawings

The permanent works drawings the designer is to work from. The designer is to confirm the revisions held before starting design.

Number	Title	Revision	Status
C 101	Pipeline plan and long section	C	Issued for construction
C 102	Trench details	B	Issued for construction

Provided with this brief: permanent works drawings, concept or method sketches and markups, existing and permanent utilities, survey, geotechnical information, methodology and sequencing and plant data sheets. The documents not provided, and how each document is provided, are listed in Appendix G.

3 Design basis data

The data for each excavation, each value printed once. Yellow cells are still to be completed. The drawings in Part 2 are generated from the same data; levels are to the project datum, AHD.

3.1 L1 Inlet pipe trench, chainage 0 to 45

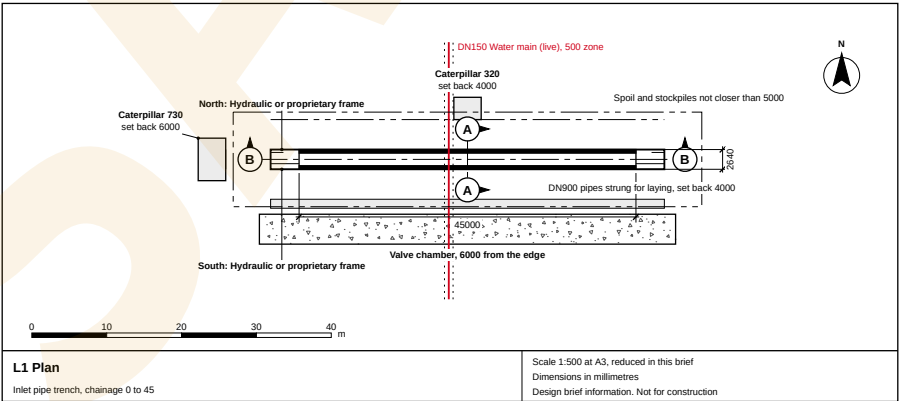


Figure 3.1 L1 Inlet pipe trench, chainage 0 to 45. Plan. Sketch for context, not to scale as printed; drawn to scale on TW 015-SK-03 in Part 2.

Table 3.1 Geometry and levels

Length	45 m	Width at the base between faces	2.64 m
Existing surface RL	12.40	Base RL	8.60
Maximum depth	3.8 m	Datum	AHD
Clear working width required	2.4 m	Clear width inside the support	2.4 m
Rock head RL	None expected or not stated	Open period	6 weeks

Table 3.2 Method on each side

The method proposed by the author for each side. Left and right are the long sides, looking from the start end toward the finish end.

Side	Label	Method	Details	Outside catalogue
Left side	North	Shoring	Shoring (Hydraulic or proprietary frame, toe RL 8.60); thickness 0.12 m	No
Right side	South	Shoring	Shoring (Hydraulic or proprietary frame, toe RL 8.60); thickness 0.12 m	No
Start end	West end	Batter	Batter at 45° from horizontal	
Finish end	East end	Batter	Batter at 45° from horizontal	

Excavation below the toe of the support: No.

Table 3.3 Ground profile

The layers from the top down, from Example Geotechnics report G 001 (2025), BH01. Ground within the footprint previously excavated, backfilled or treated: No.

No	Material	Description	Top RL	Bottom RL
1	Fill, controlled	Compacted sand fill, medium dense	12.40	11.60
2	Sand	Medium dense to dense, fine to medium grained	11.60	3.40

Table 3.4 Geotechnical parameters

Each value with its basis, as recorded by the author from the documents named; this brief supplies no values of its own. The values are from Example Geotechnics report G 001 (2025), BH01. Grey cells are parameters that do not apply to the material.

Parameter	Layer 1: Fill, controlled RL 12.40 to 11.60	Layer 2: Sand RL 11.60 to 3.40
Bulk unit weight (kN/m³)	18 (measured)	19 (measured)
Effective cohesion (kPa)	0 (measured)	0 (measured)
Effective friction angle (degrees)	32 (measured)	34 (measured)
Dilation angle (degrees)	0 (measured)	4 (measured)
Stiffness modulus (MPa)	20 (measured)	35 (measured)
Poisson's ratio	0.3 (measured)	0.3 (measured)
At rest earth pressure coefficient	0.47 (measured)	0.44 (measured)
Permeability (m/s)	1e-5 (measured)	5e-5 (measured)

Groundwater is not within the depth of influence of the excavation and its support. Evidence: RL 6.20 read 14 Aug 2025 at Standpipe BH01 (standpipe reading), 2.4 m below the base. The remaining groundwater items do not apply.

Table 3.5 Surcharges other than plant

Spoil, stored materials, traffic and site buildings beside the excavation, at their set backs from the edge.

Surcharge	Description	Side	Set back (m)	Width (m)	Height (m)	Pressure (kPa)
Material storage or pipe stringing	DN900 pipes strung for laying	South	4	1.2	1	To be set by the designer

Table 3.6 Loads whose line at the angle of repose meets the excavation

A line is drawn from the near edge of each load toward the excavation at 32 degrees, the lowest effective friction angle recorded within the depth (Fill, controlled, Compacted sand fill, medium dense). Where it meets the excavation at or above the base, the load bears on the excavation and its support: the designer is to factor it into the design at the position stated, or require it to be kept back beyond the line, and is to confirm the angle adopted.

Load	Side	Set back (m)	Line at 32 degrees	Services in the zone below it
Plant: Caterpillar 320	North	4	Meets it at RL 9.90	None
Surcharge: DN900 pipes strung for laying	South	4	Meets it at RL 9.90	None
Spoil or stockpile at the minimum distance (EXQ043)	North	5	Meets it at RL 9.28	None
Spoil or stockpile at the minimum distance (EXQ043)	South	5	Meets it at RL 9.28	None

The lines from the other loads plant: Caterpillar 730 (West end, 6 m back), spoil or stockpile at the minimum distance (EXQ043) (West end, 5 m back) and spoil or stockpile at the minimum distance (EXQ043) (East end, 5 m back) pass below the base of the excavation.

Table 3.7 Adjacent structures

Structures within reach of the excavation, how they are founded, and the movement each can take with its source.

Structure	Side	Distance (m)	Foundation	Founding RL	Loading state and who controls it	Movement limit	Early age
Valve chamber	South	6	Raft	10.00		15 mm allowable, Permanent works designer	No

Table 3.8 Services

Services crossing, beside or within the excavation, located and proven, with the clearance at which mechanical excavation stops.

Service	Owner	Position	Offset (m)	Invert RL	Dia (mm)	Live	Clearance and method inside it
DN150 Water main	Water authority	Crossing, runs across	20	11.20	150	Yes	Mechanical excavation stops 500 mm from the asset; vacuum excavation or hand excavation inside it. Needs temporary support

Table 3.9 Service clearance zones and the loads over them

Where each service's clearance zone sits against the excavation, and the loads whose line at the angle of repose passes over it.

Service	Clearance (mm)	Clearance zone and the excavation	Loads over it at the angle of repose
DN150 Water main	500	Within or crossing the excavation: the ground within the zone is removed by vacuum or hand excavation	Caterpillar 320, Caterpillar 730 and DN900 pipes strung for laying where each stands over the crossing. The designer is to allow for these loads in the protection of the service, or have them kept clear of it.

Table 3.10 Footings and the line at the angle of repose

Lines at 32 degrees, the lowest effective friction angle recorded within the depth (Fill, controlled, Compacted sand fill, medium dense) from the near edge of each footing. Where a line meets the excavation the footing bears on it: the designer is to include its load and assess the effect of the excavation on the structure.

Structure	Side	Distance (m)	Line from RL	Line at 32 degrees
Valve chamber	South	6	10.00	Passes below the base

Drawings: the section, long section, plan, support details and stage sketches of this excavation are on TW 015-SK-02 to SK-12 in Part 2.

3.2 For every location

The designer is to state the values adopted for every layer and their basis in the design statement, and is not to proceed on assumed values that have not been accepted. What each parameter governs is set out in Appendix E.

Table 3.11 Plant register (proposed loading)

Every item of plant working beside or over the excavation, the manufacturer's published figures used, and where it works. The document each figure comes from, and simple arithmetic on the published data, are in Appendix E.

Plant	Mass	Published data used	Where it works
Caterpillar 320 Tracked excavator	21.6 t operating mass	track length 3.65 m (Length to Center of Rollers (item 8)); shoe 0.6 m; gauge 2.38 m; published ground pressure 44.9 kPa	North; set back 4 m from the edge; works over the excavation; Excavation and pipe laying
Caterpillar 730 Dump truck	51.51 t loaded: empty operating mass 23.51 t plus rated payload 28.0 t	wheelbase 5.679 m; axle loads 17.61, 17.07, 16.84 t	West end; set back 6 m from the edge; Spoil haulage

4 Constraints and requirements

The author's typed answers, each with the document or practice it rests on. Answers derived from the data are in Section 3; every question with its status is in Appendix A.

Service clearance

No mechanical excavation is permitted within 500 mm of any service. Inside the clearance stated for each service, which is never less than 500 mm, the ground is removed by vacuum excavation or hand excavation. The clearance zones are shown on the sections, the plan and the structures and services details in Part 2.

Brief administration

EXQ008 Company procedure governing temporary works on this project, if any: Contractor temporary works procedure, current revision *Project specification*

Excavation locations and geometry

EXQ016 Does the stated depth include bedding, blinding and any over excavation: Yes *Good construction practice*

EXQ018 Is a current survey of the area available: Yes *Good construction practice*

Excavation method and support

Answered no: does the sequence assume a particular support type or product (EXQ146); will the support be installed, repositioned or removed by crane (EXQ147). *the sources are in Appendix A*

Ground conditions

EXQ020 Is there a geotechnical investigation report covering this location: Yes *AS 1726; AS 4678*

EXQ021 Report reference, author and date: Example Geotechnics, report G 001, 2025 *Manual input*

EXQ022 Distance from the nearest borehole or probe to the excavation (m): 18 *Manual input*

EXQ023 Does the investigation extend below the likely toe level of the support: Yes *AS 1726; AS 4678*

EXQ025 Does the report give geotechnical design parameters: Yes *Good construction practice; AS 1726; AS 4678*

EXQ028 Who will supply further geotechnical information if the designer asks for it (Party): Contractor, through the project geotechnical consultant *Manual input*

Answered no: is problem ground known or suspected, for example uncontrolled fill, soft clay, loose sand, voids, sink holes or solution cavities, acid sulfate soils or contamination (EXQ026); are there previous excavations or backfilled trenches near the footprint, outside it (EXQ027). *the sources are in Appendix A*

Groundwater and surface water

Answered no: do surface water flow paths lead toward the excavation (EXQ037); is artesian or confined groundwater known or suspected below the base of the excavation (EXQ198). *the sources are in Appendix A*

Surcharges and plant

EXQ043 Minimum distance from spoil or stockpiles to the excavation edge (m): 5.0 *CIRIA Report 97; WA Excavation code of practice*

EXQ044 Material storage, pipe stringing or site sheds near the edge (Describe): Pipes strung 4 m from edge *Manual input*

EXQ195 Operations by others during the life of the works that could load the support or constrain its geometry, with their period: None known *Good construction practice*

Answered no: is a public road, haul road or railway beside the excavation (EXQ045); do footings of adjacent structures apply load within the influence of the excavation (EXQ046); must the support carry other loads, for example suspended services, access platforms or pipe supports (EXQ047); will plant or vehicles need to cross the excavation (EXQ048). *the sources are in Appendix A*

Adjacent structures and services

EXQ054 Have underground services been located and proven by potholing: Yes *WHS (General) Regulations 2022 (WA); WA Excavation code of practice*

EXQ056 Do any services need temporary support or protection: Yes *Good construction practice; CIRIA Report 97; WA Excavation code of practice*

EXQ057 Who designs the temporary support of services (Party): Temporary works designer, as part of this brief *Manual input*

EXQ059 Are third party asset owner approvals needed, and who obtains them (Describe): Water main owner approval, obtained by contractor *Manual input*

EXQ058 Are there overhead services or height restrictions affecting installation plant: No *Good construction practice; WHS (General) Regulations 2022 (WA); WA Excavation code of practice*

Interface with the permanent works

EXQ061 Has the permanent works designer been consulted on the temporary works concept: Yes *TWfAU2020:01; BS 5975-1*

EXQ143 What becomes of the support at completion: Removed in full *Good construction practice; TWfAU2020:01; BS 5975-1*

Answered no: does the support bear on, connect to or apply load to any permanent works (EXQ062); does the permanent works design assume a particular construction or backfill sequence (EXQ065); must pipes, structures or penetrations pass through the line of the support (EXQ066). *the sources are in Appendix A*

Sequence, stages and hold points

EXQ072 Equipment available on site or from a named hire branch that the design should use where it can, such as shoring stock and sizes (Describe): Hire supplier to be confirmed *Manual input*

EXQ074 Other installation constraints, for example access width, headroom, working hours (Describe): Access from the north side only *Manual input*

- EXQ075 Are there levels or positions where props or walers would clash with the permanent works, lifting or pipe laying (Describe): Keep a clear zone 1.5 m above the base for pipe laying *Good construction practice*
- EXQ076 Backfill sequence and the stage at which support is removed (Describe): Backfill in 300 mm layers, frames raised as the backfill rises *TWfAU2020:01; BS 5975-1*
- EXQ077 Removal method and any risk that extraction affects the completed works (Describe): Frames lifted by the excavator after the backfill reaches the lower frame *Good construction practice*
- EXQ078 Access and egress for workers into the excavation (Select all that apply): Ladder secured and extending above the edge *WHS (General) Regulations 2022 (WA); WA Excavation code of practice*
- EXQ185 Greatest distance a worker in the excavation would travel to a means of egress (m): 10 *Good construction practice; WHS (General) Regulations 2022 (WA); WA Excavation code of practice*
- EXQ079 Edge protection arrangement (Select all that apply): Rigid barrier or handrail at the set back *Good construction practice; WHS (General) Regulations 2022 (WA); WA Excavation code of practice*
- EXQ201 How the formation is protected while the excavation is open, for example blinding, a sump and the time allowed before blinding: Pipe bedding placed on the day the base is reached; no base left open overnight *Good construction practice; BS 5975-1*
- EXQ202 Compaction plant used for the backfill near the support, and at what stage: Plate compactor in 300 mm layers as the frames are raised; no vibratory roller within 2 m of the frames *Good construction practice; BS 5975-1*
- EXQ203 Arrangements if work is suspended with the excavation open: Trench fenced and covered at the end of each shift; inspection before entry when work resumes *Good construction practice; BS 5975-1*
- EXQ122 How will design changes be handled if site conditions differ from the brief (Describe): Designer to respond within 2 working days; changes go through the full design process *Good construction practice; TWfAU2020:01; BS 5975-1*
Answered no: are there vibration or noise limits that affect installation (EXQ073); is there a risk of plant or lifted loads striking props or walers (EXQ080). *the sources are in Appendix A*

Public safety and environment

- EXQ166 Environmental matters that bear on the method (Select all that apply): None identified *Good construction practice*
- EXQ154 Could failure or the works affect the public or third parties beyond the site boundary: No *Good construction practice; TWfAU2020:01*

Performance criteria, standards and categorisation

- EXQ090 Deflection or movement limits for the support, with their source (mm and source): 25 mm at the top of the support, from the contractor *Good construction practice; AS 4678; CIRIA C760*
- EXQ091 Client or project specifications that apply to temporary works (List): Project specification section on temporary works *Project specification*
- EXQ092 Standards the design is to comply with (List): AS 4678, AS 4100, AS/NZS 1170 series *Project specification*

Deliverables, monitoring and inspection

- EXQ109 Who installs, reads and reviews the monitoring (Parties): Surveyor installs and reads, site engineer reviews against triggers *Manual input*
- EXQ164 Inspection frequency while the excavation is open: Daily before entry and after rain or ground disturbance *WHS (General) Regulations 2022 (WA); WA Excavation code of practice*
- EXQ165 Competent person who inspects: Site supervisor *WHS (General) Regulations 2022 (WA); WA Excavation code of practice*
- EXQ111 Document format, numbering and review turnaround periods (Describe): PDF through document control, 5 working day review *Manual input*

Preferred concept and screening prompts

The preferred concept, from the method entered for each side, is hydraulic or proprietary frame. The designer may propose an alternative where it is unsuitable, and is to advise the author before proceeding with it.

Table 4.1 Concept screening prompts

Prompts on the preferred concept for the designer's attention. They do not assess adequacy.

Prompt	Screening prompt
EXC003	Shields and boxes do not control ground movement outside the trench. Check against movement limits for adjacent structures.
EXC004	Crossing services obstruct box placement. Check box lengths against service positions.

5 Sequence, stages and hold points

The stages the site expects. The design follows the sequence or states the departures; each hold point is released by the party named before the next stage starts.

Table 5.1 Construction stages

4 stages with 3 hold points; the stage sketches are on TW 015-SK-09 to SK-12.

No	Work in the stage	Dig to RL	Support	Backfill	Hold point and who releases it
1	Excavate to the first frame level and install the top frame from outside the excavation Plant: Caterpillar 320	10.90	Partial to RL 10.90		
2	Excavate to the base, installing the second frame as the dig passes its level Plant: Caterpillar 320	8.60	Installed to RL 8.60		Inspection before entry: Frames installed and pinned, base inspected Released by the Temporary Works Coordinator
3	Lay the pipe and backfill in 300 mm layers to the lower frame Plant: Caterpillar 320	8.60	Installed to RL 8.60	Compacted backfill to RL 10.50	Permit to continue: Compaction test results before the lower frame is lifted Released by the Contractor site team
4	Raise the frames as the backfill rises and remove them at the surface Plant: Caterpillar 320	8.60	Removed	Compacted backfill to RL 12.40	Permit to strike Released by the Temporary Works Coordinator

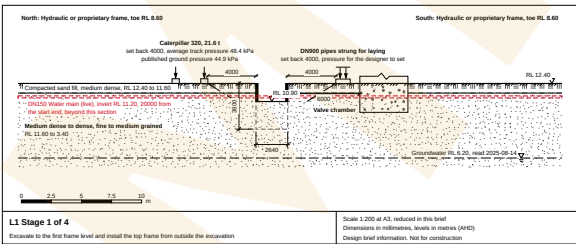


Figure 5.1 L1 Inlet pipe trench, chainage 0 to 45. Stage 1 of 4. Sketch for context, not to scale as printed; drawn to scale on TW 015-SK-09 in Part 2.

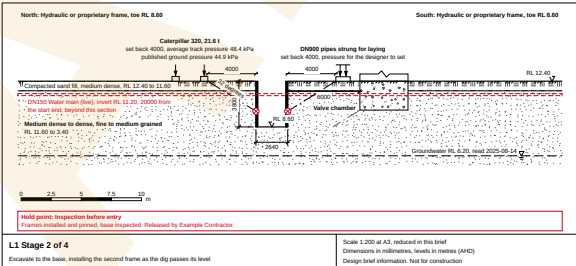


Figure 5.2 L1 Inlet pipe trench, chainage 0 to 45. Stage 2 of 4. Sketch for context, not to scale as printed; drawn to scale on TW 015-SK-10 in Part 2.

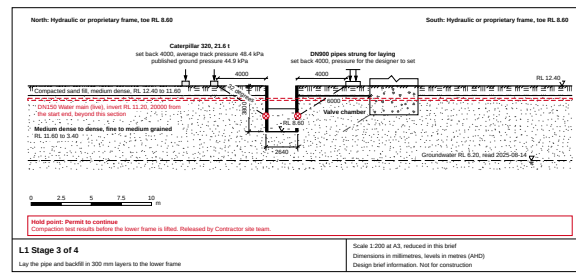


Figure 5.3 L1 Inlet pipe trench, chainage 0 to 45. Stage 3 of 4. Sketch for context, not to scale as printed; drawn to scale on TW 015-SK-11 in Part 2.

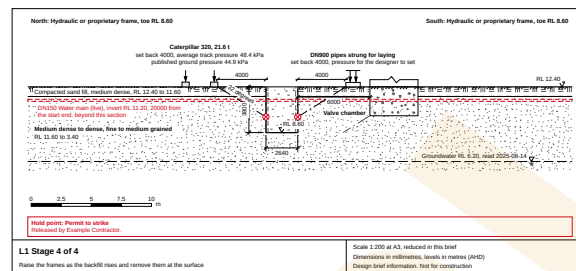


Figure 5.4 L1 Inlet pipe trench, chainage 0 to 45. Stage 4 of 4. Sketch for context, not to scale as printed; drawn to scale on TW 015-SK-12 in Part 2.

No design sensitivity is recorded; the designer is to state in the design any feature where a small departure on site would invalidate it.

6 Categorisation, deliverables and inspections

Categorisation after the TWfAU Temporary Works Risk Guidelines: the author states CFR2, DCR2, ER2 and check category 2; the level each stands for and the reason are in Section 1. From the brief data the tool proposes CFR2, DCR2, ER2 and check category 2. The author's reasoning in full, the proposal with its reasoning, every deliverable and inspection the TWfAU guide lists and the permit stages are in Appendix D.

Design checking: Checked by an individual not involved in the design and not consulted by the designer. The checker is the design checker, Example Checking Engineers (different organisation, not involved in the design), which meets the independence required.

Deliverables: the designer is to provide for design complexity DCR2:

- Design sketches or drawings: general arrangement, sections, details, notes and the interfaces with other works
- Design calculations
- Design report: inputs, methodology, standards, risks considered and residual, calculations and records
- Design certificate
- Design check certificate
- Safety in design register, with the residual risks written on the drawings
- Construction methodology and sequence drawings
- Inspection and test plan with the hold points and the permit stages
- Documentation (good construction practice, see DIT PC-CN4): list of the reference documents used in the design, with their revisions; list of departures from the brief, the standards or the permanent works, each with its status; job specific risk assessments for erection, use, maintenance and dismantling; list of the approvals obtained and those still required, with who obtains each; record of the construction team's acceptance of the design documentation; statement of how the heightened risk of failure has been treated in the design

Inspections: the installed works are inspected before the permit to load by:

- Installation inspected and the permit signed by the package owner and the supervisor
- Installation inspected by the temporary works inspector before the permit to load

The concept design activities DCR2 calls for are listed in Appendix B.

7 Responsibilities

Table 7.1 The parties to the works

The organisation and the person named for each party; the full register with the keys the matrix in Appendix D uses is there.

Key	Party	Organisation and named person
TWC	Temporary Works Coordinator	Example Contractor, A. Sample
Chk	Design checker	Example Checking Engineers

No organisation or person is named yet for the contractor site team, package owner, temporary works designer, temporary works inspector, geotechnical consultant, permanent works designer, subcontractor or installer, equipment supplier, surveyor or monitoring provider and client or asset owner.

The temporary works designer (TWD) is responsible for concept design and option selection, detailed design of the support, design of temporary support to services and manage design changes when site conditions differ. It is consulted on 10 other activities. The full matrix, with who is responsible (R), accountable (A), consulted (C) and informed (I) for every activity, is in Appendix D. The allocation is to be confirmed in writing with each party, or listed as an open item in Section 8.

8 Open items and information gaps

No item is entered in the open items register.

Raised by the gap check at issue and not entered in the register, for the designer's information

EXR014	Advisory. Regulatory duties for deeper excavations and trenches apply, including documented safe work method and collapse prevention. Action: Confirm the threshold value against the current regulations. Confirm documentation is in place. <i>WHS (General) Regulations 2022 (WA); WA Excavation code of practice</i>
EXR043	Advisory. Shields protect people inside them but do not by themselves control ground movement outside. Action: Ask the designer to confirm whether the box suits the movement limits. <i>Good construction practice; CIRIA Report 97; WA Excavation code of practice</i>
EXR117	Advisory. The line at the angle of repose from the surcharge meets the excavation at or above its base, so the surcharge bears on the excavation and its support. Action: The designer is to include the surcharge in the design at its stated position and show its exclusion zone on the drawings, or the surcharge is to be kept back beyond the line. <i>Good construction practice; AS 4678</i>
EXR118	Advisory. The service carries part of the surcharge. Action: The designer is to factor the surcharge into the design, including the protection or support of the service, or the surcharge is to be kept clear of the service. <i>Good construction practice; AS 4678</i>
EXR129	Advisory. The classification affects the investigation and the monitoring the designer will expect. Action: State the structure classification under AS 4678 with the reason, and check that the ground information and the monitoring in this brief suit it. <i>AS 4678</i>

9 What the designer is to return

1. Written confirmation of receipt, with any query or additional information requirement, before design starts.
2. The design statement responding to this brief, stating the edition of each document the design is to; the requirements of the designer are in Appendix B.
3. The return brief in Appendix C, each item confirmed or queried, and the deliverables listed in Section 6.

Part 2. Drawings

The drawings are A3 landscape sheets generated from the brief data to the house drafting standard, numbered by the brief reference: 12 sheets, TW 015-SK-01 to TW 015-SK-12. Each carries the status line: they are information for the designer, not a design. The same drawings are available as a DXF file for AutoCAD from the brief's Issue tab, in model space at full size with true levels.

Drawing register

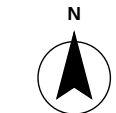
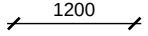
The sheets that follow, in order.

Drawing number	Title	Scale at A3
TW 015-SK-01	Drawing register, legend and general notes	Not to scale
TW 015-SK-02	L1 Inlet pipe trench, chainage 0 to 45. Sections	1:100, 1:250
TW 015-SK-03	L1 Inlet pipe trench, chainage 0 to 45. Plan	1:500
TW 015-SK-04	L1 Inlet pipe trench, chainage 0 to 45. Support details	1:20
TW 015-SK-05	L1 Inlet pipe trench, chainage 0 to 45. Surcharge details	1:100
TW 015-SK-06	L1 Inlet pipe trench, chainage 0 to 45. Surcharge details	1:500
TW 015-SK-07	L1 Inlet pipe trench, chainage 0 to 45. Structures and services details	1:100
TW 015-SK-08	L1 Inlet pipe trench, chainage 0 to 45. Structures and services details	1:250
TW 015-SK-09	L1 Inlet pipe trench, chainage 0 to 45. Stage 1	1:100
TW 015-SK-10	L1 Inlet pipe trench, chainage 0 to 45. Stage 2	1:100
TW 015-SK-11	L1 Inlet pipe trench, chainage 0 to 45. Stage 3	1:100
TW 015-SK-12	L1 Inlet pipe trench, chainage 0 to 45. Stage 4	1:100

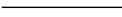
Drawing register

Drawing number	Title	Scale at A3	Rev
TW 015-SK-01	Drawing register, legend and general notes	Not to scale	A
TW 015-SK-02	L1 Inlet pipe trench, chainage 0 to 45. Sections	1:100, 1:250	A
TW 015-SK-03	L1 Inlet pipe trench, chainage 0 to 45. Plan	1:500	A
TW 015-SK-04	L1 Inlet pipe trench, chainage 0 to 45. Support details	1:20	A
TW 015-SK-05	L1 Inlet pipe trench, chainage 0 to 45. Surcharge details	1:100	A
TW 015-SK-06	L1 Inlet pipe trench, chainage 0 to 45. Surcharge details	1:500	A
TW 015-SK-07	L1 Inlet pipe trench, chainage 0 to 45. Structures and services details	1:100	A
TW 015-SK-08	L1 Inlet pipe trench, chainage 0 to 45. Structures and services details	1:250	A
TW 015-SK-09	L1 Inlet pipe trench, chainage 0 to 45. Stage 1	1:100	A
TW 015-SK-10	L1 Inlet pipe trench, chainage 0 to 45. Stage 2	1:100	A
TW 015-SK-11	L1 Inlet pipe trench, chainage 0 to 45. Stage 3	1:100	A
TW 015-SK-12	L1 Inlet pipe trench, chainage 0 to 45. Stage 4	1:100	A

Symbols

	Level marker: a reduced level in metres to the datum
	Section marker: the section letter, with the arrow toward the side the section looks
	Break line: the drawing is cut and the part between is not shown; the levels are true in each part
	North point
	Dimension in millimetres, with ticks and extension lines

Line work by layer

	AZ-TEXT (0.18 mm): labels, notes and leaders
	AZ-DIM (0.18 mm): dimensions, extension lines and dimension text
	AZ-LEVEL (0.18 mm): level markers and level text
	AZ-SECTION (0.35 mm): section planes, section and elevation markers, north point, break lines
	AZ-GROUND (0.5 mm): existing ground surface and its symbol
	AZ-GROUND-LAYER (0.18 mm): boundaries between ground layers, rock head
	AZ-HATCH (0.13 mm): material hatching
	AZ-EXCAVATION (0.5 mm): the excavation as cut, at the stage drawn
	AZ-CONCRETE (0.5 mm): the pour being briefed, in section, plan and elevation
	AZ-EXISTING (0.35 mm): existing structures, footings, lifts cast before, the structure a scaffold stands against
	AZ-SUPPORT (0.35 mm): excavation support as entered, ground treatment, backfill
	AZ-INDICATIVE (0.25 mm): members drawn indicatively at nominal sizes and spacings
	AZ-PLANT (0.35 mm): plant footprints, surcharges, stacked materials
	AZ-LOAD (0.18 mm): load arrows
	AZ-SERVICE (0.35 mm): underground services
	AZ-ZONE (0.18 mm, dotted): service clearance zones
	AZ-LIMIT (0.25 mm, phantom): set back limits, spoil limits, plant lines
	AZ-WATER (0.25 mm, dashed): groundwater level and its symbol
	AZ-REPOSE (0.25 mm, dash dot): lines at the angle of repose from loads and footings
	AZ-PRESSURE (0.35 mm): concrete pressure diagram and its resultant
	AZ-REBAR (0.5 mm): reinforcement that runs through a construction joint or a form face, as the permanent works drawings give it, drawn at a nominal cover
	AZ-WARN (0.35 mm): warnings

Hatches and their AutoCAD patterns

	Sand (AR-SAND)		Fill and made ground (EARTH)
	Gravel (GRAVEL)		Stabilised or cement treated ground (ANSI37)
	Silt (MUDST)		Grouted ground (DOTS)
	Clay (ANSI31)		Other ground treatment (ANSI32)
	Organic soil and peat (SWAMP)		Backfill (EARTH)
	Rock (AR-B816)		Light screen picking out the subject of a figure (SOLID)
	Concrete (AR-CONC)		

Notes

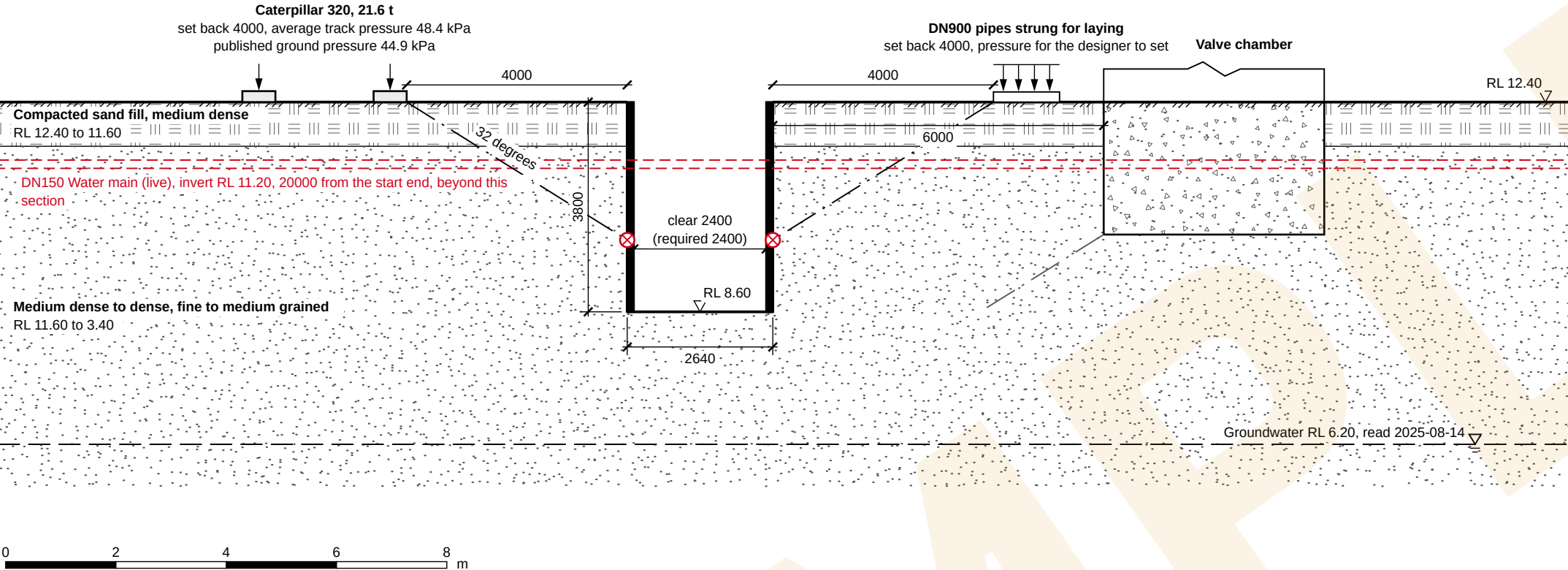
General notes

- Design brief information. Not for construction. The drawings show the information in the brief for the designer; they are not a design.
- Dimensions are in millimetres and levels in metres to AHD.
- The scales are stated at A3. Use the scale bar on each view; do not scale a print of another size.
- Members on the layer AZ-INDICATIVE, drawn grey, are shown at nominal sizes and spacings to explain the arrangement the brief describes. The design sets them.
- Colour is used for warnings only: hold points, lines that meet the excavation, services under load, live services and limits exceeded.
- Where a drawing needs data the brief does not hold, the view draws what the data supports and its notes say what is not drawn.
- Key plans are not drawn: the brief data does not set out the works on the site. The reference drawings listed in the brief show the location.
- The same drawings are available as a DXF file for AutoCAD from the brief's Issue tab: model space in millimetres with true levels, on the layers above.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title Drawing register, legend and general notes			
Drawing number TW 015-SK-01			Rev A
Scale at A3 Not to scale		Date 29 Sept 2026	Sheet 1 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

North: Hydraulic or proprietary frame, toe RL 8.60

South: Hydraulic or proprietary frame, toe RL 8.60



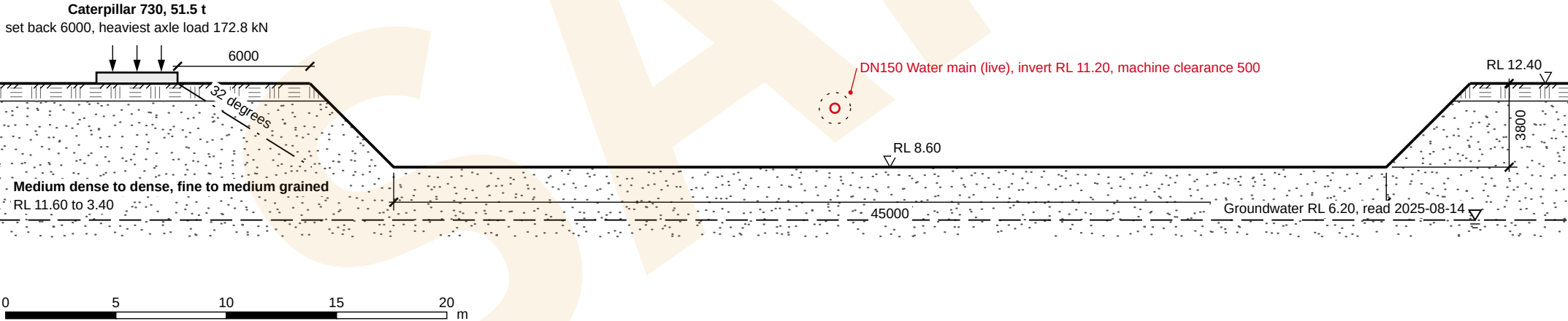
L1 Section A-A across the excavation

Inlet pipe trench, chainage 0 to 45

Scale 1:100 at A3
Dimensions in millimetres, levels in metres (AHD)

West end: Batter at 45 degrees

East end: Batter at 45 degrees



L1 Long section B-B along the excavation

Inlet pipe trench, chainage 0 to 45

Scale 1:250 at A3
Dimensions in millimetres, levels in metres (AHD)

Notes

Section A-A across the excavation

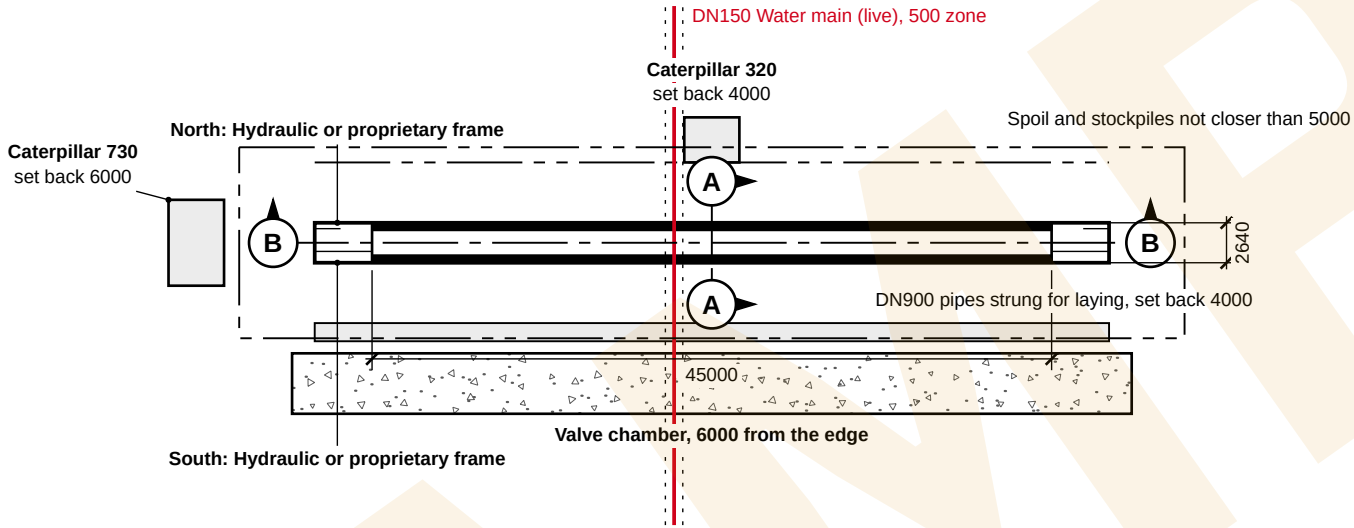
- Lines at the angle of repose: 32 degrees, the lowest effective friction angle recorded within the depth (Fill, controlled, Compacted sand fill, medium dense)
- The line at 32 degrees from Caterpillar 320 meets the excavation at RL 9.90; the designer is to factor it into the design
- The line at 32 degrees from DN900 pipes strung for laying meets the excavation at RL 9.90; the designer is to factor it into the design

Long section B-B along the excavation

- Lines at the angle of repose: 32 degrees, the lowest effective friction angle recorded within the depth (Fill, controlled, Compacted sand fill, medium dense)

Legend and general notes: sheet TW 015-SK-01.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Sections			
Drawing number TW 015-SK-02			Rev A
Scale at A3 1:100, 1:250		Date 29 Sept 2026	Sheet 2 of 12
Design brief information. Not for construction Issued 29 Sept 2026			



L1 Plan

Inlet pipe trench, chainage 0 to 45

Scale 1:500 at A3
Dimensions in millimetres

Notes

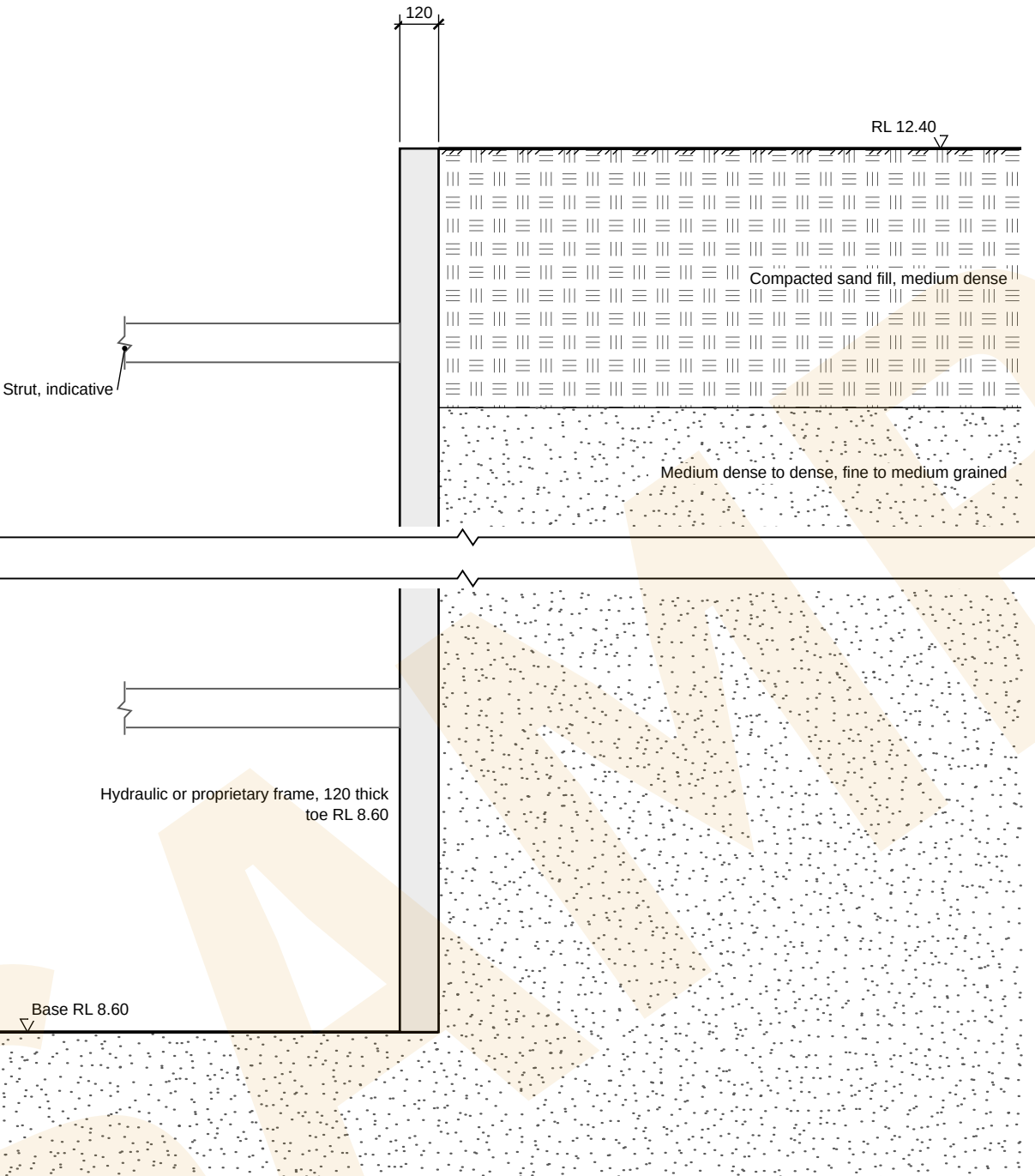
Plan

1. West end: Batter (not labelled on the plan)
2. East end: Batter (not labelled on the plan)

Legend and general notes: sheet TW 015-SK-01.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Plan			
Drawing number TW 015-SK-03			Rev A
Scale at A3 1:500		Date 29 Sept 2026	Sheet 3 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

North and South: Hydraulic or proprietary frame, 120; depth 3800 from RL 12.40 to RL 8.60



L1 Support detail at the North and South faces

Hydraulic or proprietary frame

Scale 1:20 at A3
Dimensions in millimetres, levels in metres (AHD)

Notes

Support detail at the North and South faces

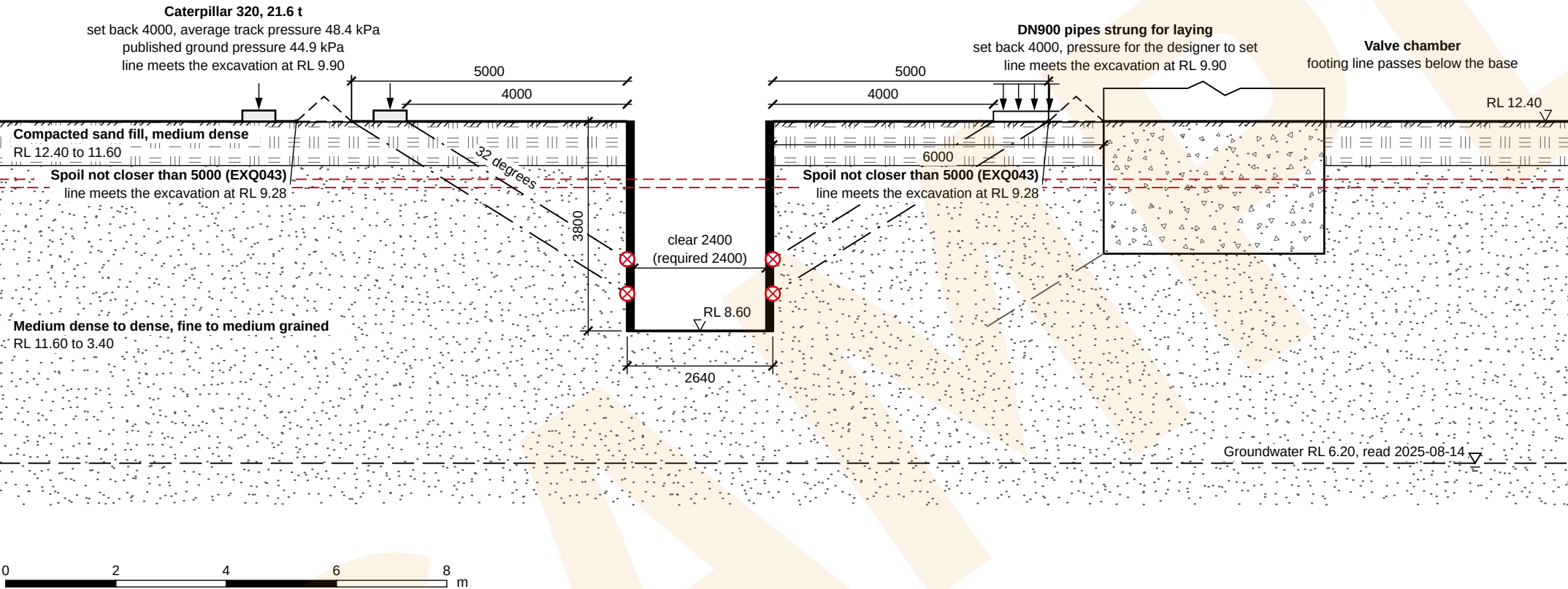
1. Struts drawn indicatively at nominal levels and sizes; the design sets their number, levels, sizes and spacing
2. Drawn broken to keep the scale: RL 12.80 to 11.20, RL 10.00 to 8.15; the levels are true in each part
3. Groundwater RL 6.20, below the extent drawn

Legend and general notes: sheet TW 015-SK-01.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Support details			
Drawing number TW 015-SK-04			Rev A
Scale at A3 1:20		Date 29 Sept 2026	Sheet 4 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

North: Hydraulic or proprietary frame, toe RL 8.60

South: Hydraulic or proprietary frame, toe RL 8.60



Warning
The line at 32 degrees from Caterpillar 320 meets the excavation at RL 9.90; the designer is to factor it into the design. The line at 32 degrees from DN900 pipes strung for laying meets the excavation at RL 9.90; the designer is to factor it into the design. The line at 32 degrees from spoil at its minimum distance meets the excavation at RL 9.28; the designer is to factor it into the design.

L1 Surcharge detail across the excavation

Plant and surcharges with lines at the angle of repose

Scale 1:100 at A3
Dimensions in millimetres, levels in metres (AHD)

Notes

Surcharge detail across the excavation

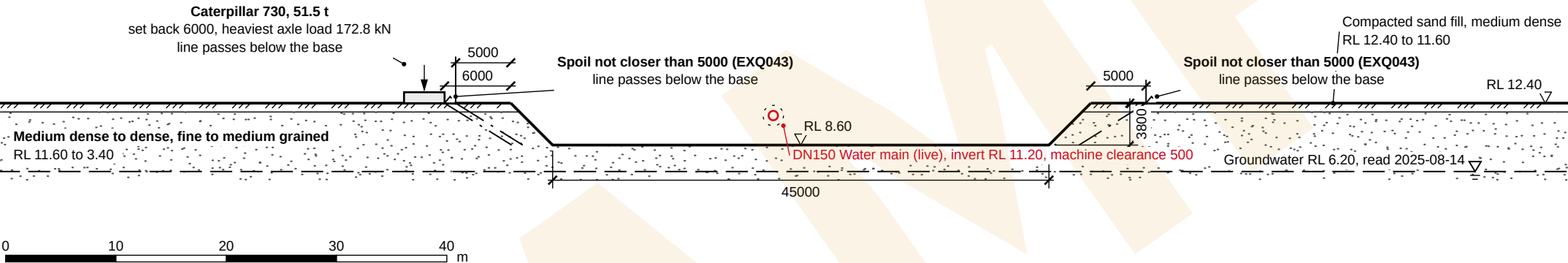
- Lines at the angle of repose: 32 degrees, the lowest effective friction angle recorded within the depth (Fill, controlled, Compacted sand fill, medium dense)
- DN150 Water main (live), invert RL 11.20, 20000 from the start end, beyond this section (not labelled on the figure)
- The line at 32 degrees from Caterpillar 320 meets the excavation at RL 9.90; the designer is to factor it into the design
- The line at 32 degrees from DN900 pipes strung for laying meets the excavation at RL 9.90; the designer is to factor it into the design
- The line at 32 degrees from spoil at its minimum distance meets the excavation at RL 9.28; the designer is to factor it into the design

Legend and general notes: sheet TW 015-SK-01.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Surcharge details			
Drawing number TW 015-SK-05			Rev A
Scale at A3 1:100		Date 29 Sept 2026	Sheet 5 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

West end: Batter at 45 degrees

East end: Batter at 45 degrees



L1 Surcharge detail along the excavation

Plant and surcharges at the ends with lines at the angle of repose

Scale 1:500 at A3
Dimensions in millimetres, levels in metres (AHD)

Notes

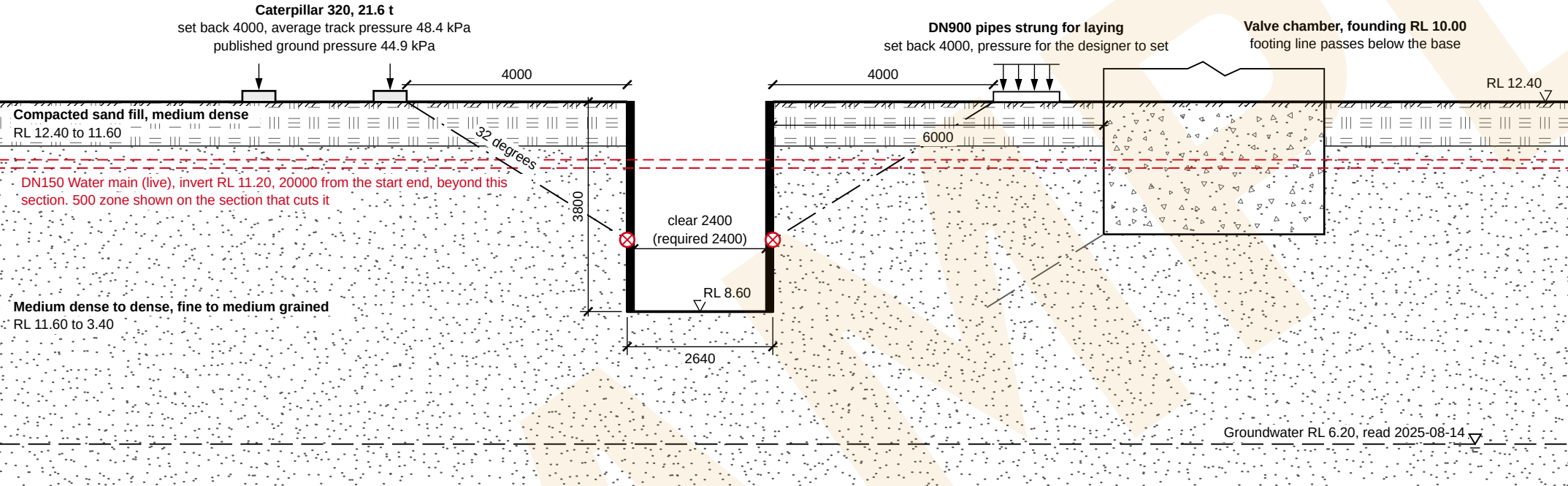
Surcharge detail along the excavation

- Lines at the angle of repose: 32 degrees, the lowest effective friction angle recorded within the depth (Fill, controlled, Compacted sand fill, medium dense)
- Legend and general notes: sheet TW 015-SK-01.**

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Surcharge details			
Drawing number TW 015-SK-06			Rev A
Scale at A3 1:500		Date 29 Sept 2026	Sheet 6 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

North: Hydraulic or proprietary frame, toe RL 8.60

South: Hydraulic or proprietary frame, toe RL 8.60



Warning
The line at 32 degrees from Caterpillar 320 meets the excavation at RL 9.90; the designer is to factor it into the design. The line at 32 degrees from DN900 pipes strung for laying meets the excavation at RL 9.90; the designer is to factor it into the design.

L1 Structures and services detail across the excavation

Footing lines at the angle of repose and service clearance zones

Scale 1:100 at A3
Dimensions in millimetres, levels in metres (AHD)

Notes

Structures and services detail across the excavation

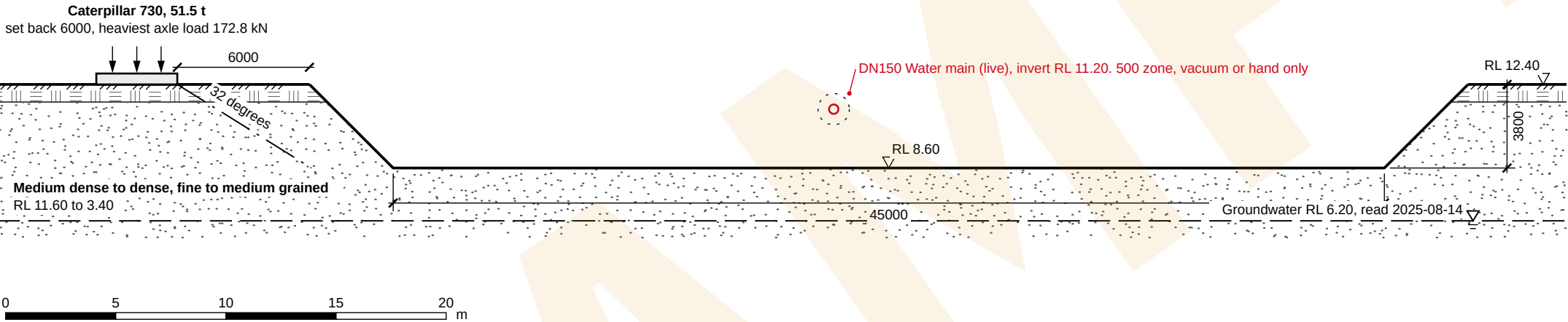
- Lines at the angle of repose: 32 degrees, the lowest effective friction angle recorded within the depth (Fill, controlled, Compacted sand fill, medium dense)
- The line at 32 degrees from Caterpillar 320 meets the excavation at RL 9.90; the designer is to factor it into the design
- The line at 32 degrees from DN900 pipes strung for laying meets the excavation at RL 9.90; the designer is to factor it into the design

Legend and general notes: sheet TW 015-SK-01.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Structures and services details			
Drawing number TW 015-SK-07			Rev A
Scale at A3 1:100		Date 29 Sept 2026	Sheet 7 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

West end: Batter at 45 degrees

East end: Batter at 45 degrees



L1 Structures and services detail along the excavation

Footing lines at the angle of repose and service clearance zones

Scale 1:250 at A3
Dimensions in millimetres, levels in metres (AHD)

Notes

Structures and services detail along the excavation

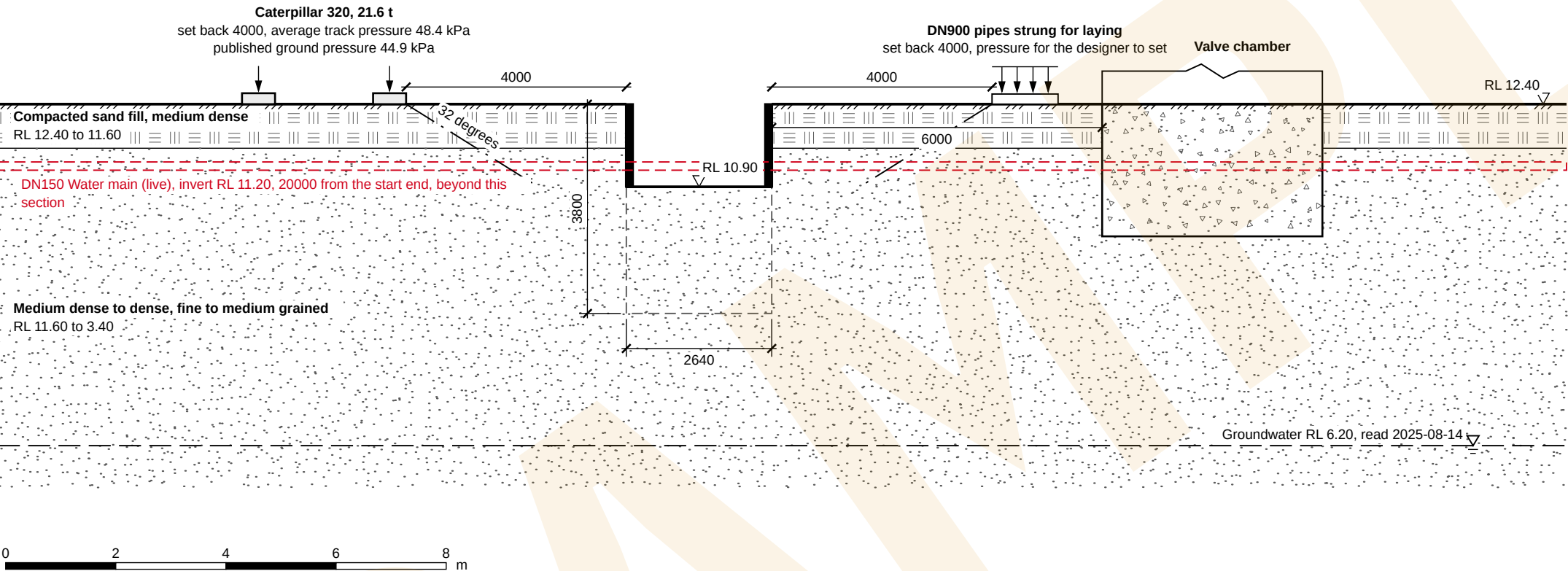
1. Lines at the angle of repose: 32 degrees, the lowest effective friction angle recorded within the depth (Fill, controlled, Compacted sand fill, medium dense)

Legend and general notes: sheet TW 015-SK-01.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Structures and services details			
Drawing number TW 015-SK-08			Rev A
Scale at A3 1:250		Date 29 Sept 2026	Sheet 8 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

North: Hydraulic or proprietary frame, toe RL 8.60

South: Hydraulic or proprietary frame, toe RL 8.60



L1 Stage 1 of 4

Excavate to the first frame level and install the top frame from outside the excavation

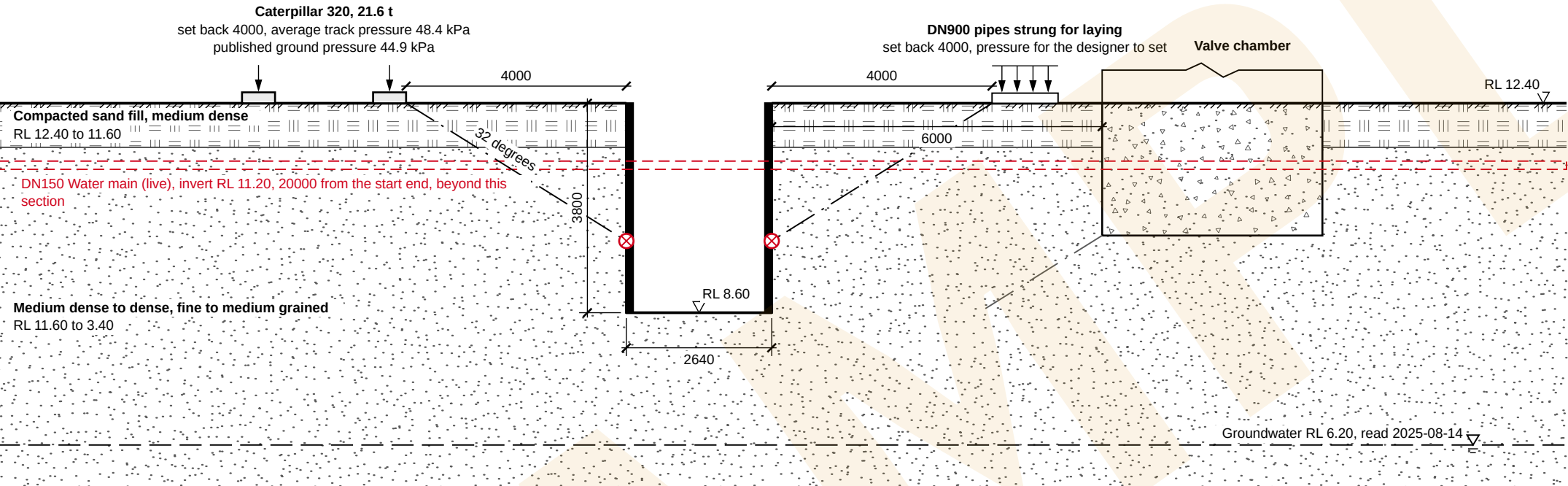
Notes

Stage 1 of 4
Legend and general notes: sheet TW 015-SK-01.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Stage 1			
Drawing number TW 015-SK-09			Rev A
Scale at A3 1:100		Date 29 Sept 2026	Sheet 9 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

North: Hydraulic or proprietary frame, toe RL 8.60

South: Hydraulic or proprietary frame, toe RL 8.60



Hold point: Inspection before entry
Frames installed and pinned, base inspected. Released by Example Contractor.

L1 Stage 2 of 4

Excavate to the base, installing the second frame as the dig passes its level

Scale 1:100 at A3
Dimensions in millimetres, levels in metres (AHD)

Notes

Stage 2 of 4

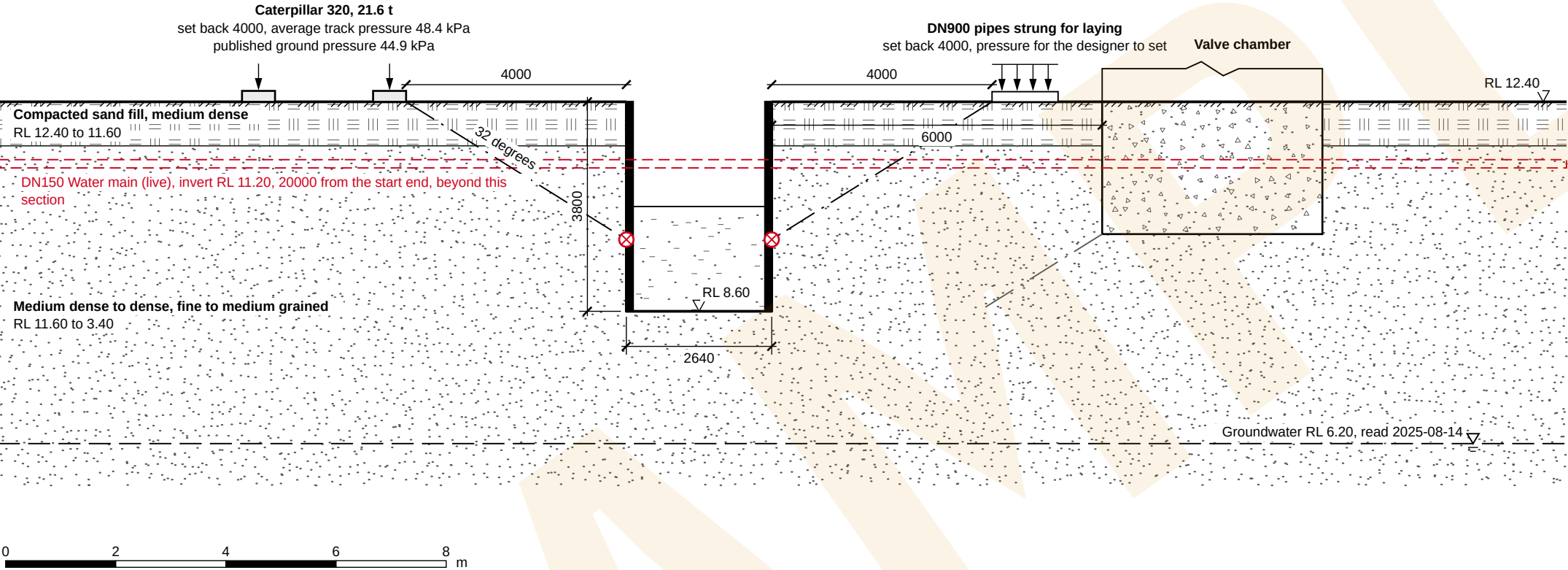
- The line at 32 degrees from Caterpillar 320 meets the excavation at RL 9.90 at this stage; the designer is to factor it into the design
- The line at 32 degrees from DN900 pipes strung for laying meets the excavation at RL 9.90 at this stage; the designer is to factor it into the design

Legend and general notes: sheet TW 015-SK-01.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Stage 2			
Drawing number TW 015-SK-10			Rev A
Scale at A3 1:100		Date 29 Sept 2026	Sheet 10 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

North: Hydraulic or proprietary frame, toe RL 8.60

South: Hydraulic or proprietary frame, toe RL 8.60



Hold point: Permit to continue
Compaction test results before the lower frame is lifted. Released by Contractor site team.

L1 Stage 3 of 4

Lay the pipe and backfill in 300 mm layers to the lower frame

Scale 1:100 at A3
Dimensions in millimetres, levels in metres (AHD)

Notes

Stage 3 of 4

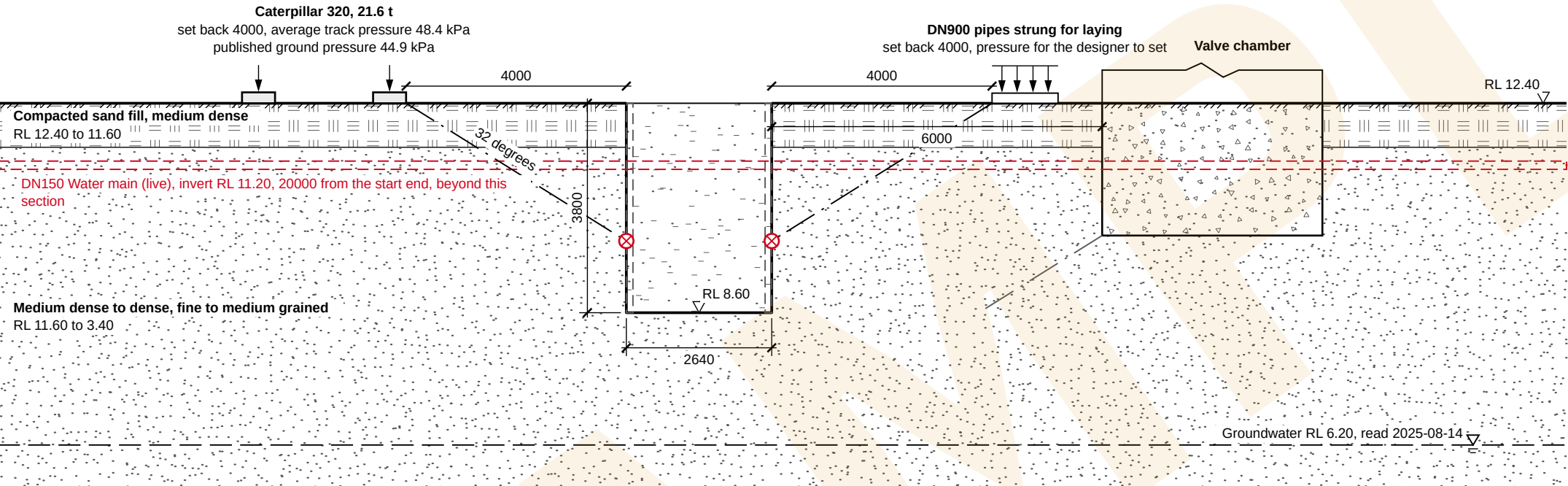
- The line at 32 degrees from Caterpillar 320 meets the excavation at RL 9.90 at this stage; the designer is to factor it into the design
- The line at 32 degrees from DN900 pipes strung for laying meets the excavation at RL 9.90 at this stage; the designer is to factor it into the design

Legend and general notes: sheet TW 015-SK-01.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Stage 3			
Drawing number TW 015-SK-11			Rev A
Scale at A3 1:100		Date 29 Sept 2026	Sheet 11 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

North: Hydraulic or proprietary frame, toe RL 8.60

South: Hydraulic or proprietary frame, toe RL 8.60



Hold point: Permit to strike
Released by Example Contractor.

L1 Stage 4 of 4

Raise the frames as the backfill rises and remove them at the surface

Scale 1:100 at A3
Dimensions in millimetres, levels in metres (AHD)

Notes

Stage 4 of 4

- The line at 32 degrees from Caterpillar 320 meets the excavation at RL 9.90 at this stage; the designer is to factor it into the design
- The line at 32 degrees from DN900 pipes strung for laying meets the excavation at RL 9.90 at this stage; the designer is to factor it into the design

Legend and general notes: sheet TW 015-SK-01.

Rev	Date	Description	By
A	29 Sept 2026	Issued for design	JC
Prepared by J. Citizen, Site Engineer, 0400 000 000 Reviewed by A. Sample Generated by TworkX from the brief data for Example Constructions			
Project Example Pump Station Upgrade, P1234			
Brief TW 015 Inlet pipe trench support			
Title L1 Inlet pipe trench, chainage 0 to 45. Stage 4			
Drawing number TW 015-SK-12			Rev A
Scale at A3 1:100		Date 29 Sept 2026	Sheet 12 of 12
Design brief information. Not for construction Issued 29 Sept 2026			

Part 3. Appendices

Appendix A Question and answer record

Every question of the Module 01. Excavation and trench support question set asked of this brief, with the response, the document or practice it rests on and its status: typed by the author, derived from the brief data, marked not applicable, or not provided. Questions the answers above made irrelevant are not asked and are not listed. The machine readable export of the brief carries the same record.

Table A.1 A. Brief administration

ID	Question	Response	Source	Status
EXQ001	Project name and number	Example Pump Station Upgrade, P1234	Manual input	Typed
EXQ002	Temporary works item title and register reference	Inlet pipe trench support, TW 015	TWfAU2020:01; BS 5975-1	Typed
EXQ003	Brief author, role and contact	J. Citizen, Site Engineer, 0400 000 000	Manual input	Typed
EXQ004	Temporary Works Coordinator: name, qualifications and role	A. Sample	TWfAU2020:01; BS 5975-1; TWfAU Procedural Control GPG	Typed
EXQ005	Date the approved design is required on site (Date)	2027-03-01	Manual input	Typed
EXQ008	Company procedure governing temporary works on this project, if any	Contractor temporary works procedure, current revision	Project specification	Typed
EXQ187	Other temporary works this excavation interfaces with or relies on, and who designs them	Not provided	Good construction practice. See also TWfAU Procedural Control GPG	Optional, not given
EXQ188	Hazards and residual risks handed down for the designer to act on, each with its source	Not provided	Good construction practice. See also TWfAU Procedural Control GPG	Optional, not given
EXQ189	Include programme dates in the brief	Not provided	Manual input	Optional, not given
EXQ120	Who engages the designer	Contractor	Good construction practice. See also TWfAU2020:01	Typed

Table A.2 B. Excavation locations and geometry

ID	Question	Response	Source	Status
EXQ157	Project level datum	AHD	Manual input	Derived
EXQ010	What each excavation is for	Pipe or service trench	Good construction practice	Derived
EXQ011	Plan dimensions at the base, length and width (m)	45 m long by 2.64 m wide (Inlet pipe trench, chainage 0 to 45)	Manual input	Derived

ID	Question	Response	Source	Status
EXQ012	Maximum excavation depth below existing surface (m)	3.8	Work Health and Safety (General) Regulations 2022 (WA); WA Excavation code of practice	Derived
EXQ013	Does the depth vary along the excavation or between locations	No	Good construction practice	Derived
EXQ014	Existing surface level and base of excavation level for each location (RL m)	surface RL 12.40, base RL 8.60, maximum depth 3.8 m, support toe RL 8.60	Manual input	Derived
EXQ015	Clear working width required inside the support at the base (m)	2.4	Manual input	Derived
EXQ016	Does the stated depth include bedding, blinding and any over excavation	Yes	Good construction practice	Typed
EXQ017	Reference drawings with revision and issue status (List)	C 101 Pipeline plan and long section rev C (Issued for construction); C 102 Trench details rev B (Issued for construction)	Manual input	Derived
EXQ018	Is a current survey of the area available	Yes	Good construction practice	Typed
EXQ210	Ground levels across the section: the crest level of each side where it differs from the surface level, and the ground behind each side as break points	Not provided	Good construction practice	Optional, not given

Table A.3 B2. Excavation method and support

ID	Question	Response	Source	Status
EXQ158	Excavation method for each side	North: Shoring (Hydraulic or proprietary frame, toe RL 8.60); South: Shoring (Hydraulic or proprietary frame, toe RL 8.60); West end: Batter at 45° from horizontal; East end: Batter at 45° from horizontal	Good construction practice. See also CIRIA Report 97; WA Excavation code of practice	Derived
EXQ071	Governing support concept	Hydraulic or proprietary frame	Good construction practice	Derived
EXQ159	Ground treatment in addition to the method	Not provided	Good construction practice. See also AS 1726; AS 4678	Optional, not given
EXQ156	Will a proprietary product be used outside its catalogue conditions	No	Good construction practice. See also TWfAU2020:01; BS 5975-1	Derived
EXQ150	Will excavation continue in rock below the toe of the support	No	Good construction practice. See also AS 1726; AS 4678	Derived
EXQ146	Does the sequence assume a particular support type or product	No	Good construction practice. See also TWfAU2020:01; BS 5975-1	Typed
EXQ147	Will the support be installed, repositioned or removed by crane	No	Good construction practice. See also BRE BR470	Typed

ID	Question	Response	Source	Status
EXQ200	Ground surface behind each side: level, rising or falling away from the excavation, with the slope	Not provided	Good construction practice. See also BS 5975-1	Optional, not given
EXQ211	Fill and working platforms: each item, where it is placed, its top level, batter slope, material, compaction requirement, plant it carries and the stages it is placed and removed	Not provided	Good construction practice. See also MRWA Specification 302; BRE BR470	Optional, not given
EXQ212	Faces built top down: the lift height, the facing, the time each lift must stand unsupported, how the drill reaches each lift, and the clear distance behind the face for nails or bolts	Not provided	Good construction practice. See also AS 1726; AS 4678	Optional, not given

Table A.4 C. Ground conditions

ID	Question	Response	Source	Status
EXQ020	Is there a geotechnical investigation report covering this location	Yes	AS 1726; AS 4678	Typed
EXQ021	Report reference, author and date	Example Geotechnics, report G 001, 2025	Manual input	Typed
EXQ022	Distance from the nearest borehole or probe to the excavation (m)	18	Manual input	Typed
EXQ023	Does the investigation extend below the likely toe level of the support	Yes	AS 1726; AS 4678	Typed
EXQ024	Ground profile at each location	Fill, controlled (RL 12.40 to 11.6), Compacted sand fill, medium dense [Example Geotechnics report G 001 (2025), BH01]; Sand (RL 11.60 to 3.4), Medium dense to dense, fine to medium grained [Example Geotechnics report G 001 (2025), BH01]	Manual input	Derived
EXQ025	Does the report give geotechnical design parameters	Yes	Good construction practice. See also AS 1726; AS 4678	Typed
EXQ026	Is problem ground known or suspected, for example uncontrolled fill, soft clay, loose sand, voids, sink holes or solution cavities, acid sulfate soils or contamination	No	Good construction practice. See also AS 1726; AS 4678	Typed
EXQ148	Is rock expected within the excavation depth	No	Good construction practice. See also AS 1726; AS 4678	Derived
EXQ149	Rock head level and its variability across the footprint (RL m)	Not provided	Manual input	Optional, not given
EXQ151	Has the ground within the footprint been previously excavated, backfilled, treated or remediated	No	Good construction practice. See also CIRIA Report 97; WA Excavation code of practice	Derived

ID	Question	Response	Source	Status
EXQ027	Are there previous excavations or backfilled trenches near the footprint, outside it	No	Good construction practice. See also CIRIA Report 97; WA Excavation code of practice	Typed
EXQ028	Who will supply further geotechnical information if the designer asks for it (Party)	Contractor, through the project geotechnical consultant	Manual input	Typed

Table A.5 C2. Geotechnical design parameters

ID	Question	Response	Source	Status
EXQ130	Bulk unit weight recorded for every layer	Yes	AS 1726; AS 4678	Derived
EXQ131	Effective cohesion recorded for every soil layer	Yes	AS 1726; AS 4678	Derived
EXQ132	Effective friction angle recorded for every soil layer	Yes	AS 1726; AS 4678	Derived
EXQ133	Undrained shear strength recorded for cohesive layers	Not applicable	Good construction practice. See also AS 1726; AS 4678	Derived
EXQ134	Dilation angle recorded or a basis stated	Yes	Good construction practice. See also AS 4678; CIRIA C760	Derived
EXQ135	Stiffness parameters recorded for every layer, modulus and Poisson's ratio	Yes	Good construction practice. See also AS 4678; CIRIA C760	Derived
EXQ136	At rest earth pressure coefficient recorded or a basis stated	Yes	Good construction practice. See also AS 4678; CIRIA C760	Derived
EXQ137	Permeability recorded for every layer	Yes	Good construction practice. See also AS 1726; AS 4678	Derived
EXQ138	Rock strength and defect data recorded where rock is within the depth of the support	Not applicable	Good construction practice. See also AS 1726; AS 4678	Derived
EXQ139	Layer boundaries given as levels to the project datum	Yes	Good construction practice. See also AS 1726; AS 4678	Derived
EXQ140	Basis of the parameters recorded	Measured on site or in laboratory	Good construction practice. See also AS 1726; AS 4678	Derived
EXQ141	Layers and parameters not yet recorded (Describe)	Not provided	Manual input	Optional, not given
EXQ142	Parameters the designer is to assume or derive, and who accepts those assumptions (Describe)	Not provided	Manual input	Optional, not given

Table A.6 D. Groundwater and surface water

ID	Question	Response	Source	Status
EXQ160	Is groundwater within the depth of influence of the excavation and its support	No	AS 1726; AS 4678	Derived

ID	Question	Response	Source	Status
EXQ030	Recorded groundwater level, date of reading and source (RL m and date)	RL 6.20, read 2025-08-14, Standpipe BH01 (Standpipe reading), 2.4 m below the base	AS 1726; AS 4678	Derived
EXQ037	Do surface water flow paths lead toward the excavation	No	Good construction practice. See also CIRIA Report 97; WA Excavation code of practice	Typed
EXQ198	Is artesian or confined groundwater known or suspected below the base of the excavation	No	Good construction practice. See also BS 5975-1; CIRIA C760; AS 1726	Typed

Table A.7 E. Surcharges and plant

ID	Question	Response	Source	Status
EXQ040	Plant register: plant working beside or over the excavation with type, model, operating mass and set back (List)	Tracked excavator, Caterpillar 320, 21.6 t (operating mass), set back 4 m, North, Excavation and pipe laying; Dump truck, Caterpillar 730, 51.5 t (loaded), set back 6 m, West end, Spoil haulage	AS 4678	Derived
EXQ041	Minimum distance from any plant to the excavation edge (m)	4	Good construction practice. See also AS 4678	Derived
EXQ042	Will a crane, piling rig or concrete pump set up near the excavation	No	Good construction practice. See also BRE BR470	Derived
EXQ049	Will an excavator sit at the crest while digging	No	Good construction practice. See also AS 4678	Derived
EXQ043	Minimum distance from spoil or stockpiles to the excavation edge (m)	5.0	CIRIA Report 97; WA Excavation code of practice	Typed
EXQ044	Material storage, pipe stringing or site sheds near the edge (Describe)	Pipes strung 4 m from edge	Manual input	Typed
EXQ045	Is a public road, haul road or railway beside the excavation	No	Good construction practice. See also AS 4678; BS 5975-1	Typed
EXQ046	Do footings of adjacent structures apply load within the influence of the excavation	No	AS 4678; CIRIA C760	Typed
EXQ047	Must the support carry other loads, for example suspended services, access platforms or pipe supports	No	Good construction practice	Typed
EXQ048	Will plant or vehicles need to cross the excavation	No	Good construction practice	Typed
EXQ195	Operations by others during the life of the works that could load the support or constrain its geometry, with their period	None known	Good construction practice	Typed

Table A.8 F. Adjacent structures and services

ID	Question	Response	Source	Status
EXQ050	Are there existing or new structures near the excavation	Yes	AS 4678; CIRIA C760	Derived
EXQ051	Each structure with distance from the edge, foundation type and founding level (List)	Valve chamber, South, 6 m from the edge, Raft, founding RL 10.00	Manual input	Derived
EXQ052	Movement or settlement limits for each structure, their type and source (mm and source)	Valve chamber: 15 mm allowable, Permanent works designer	Manual input	Derived
EXQ152	Is the loading state of an adjacent structure during the works a design condition, and who controls it	No	Good construction practice. See also AS 4678; CIRIA C760	Derived
EXQ053	Are any adjacent structures new permanent works that are recently cast or not yet at full strength	No	Good construction practice	Derived
EXQ054	Have underground services been located and proven by potholing	Yes	Work Health and Safety (General) Regulations 2022 (WA); WA Excavation code of practice	Typed
EXQ055	Services crossing, running parallel or within the footprint, with type, size, level and owner (List)	DN150 Water main, crossing, invert RL 11.20, live, Water authority	Manual input	Derived
EXQ144	Are there existing services or structures within the excavation footprint itself	Yes	Good construction practice. See also CIRIA Report 97; WA Excavation code of practice	Derived
EXQ145	For each service, the clearance at which mechanical excavation stops and the method inside it (Describe)	DN150 Water main: mechanical excavation stops 500 mm from the asset, vacuum excavation or hand excavation inside it	Manual input	Derived
EXQ056	Do any services need temporary support or protection	Yes	Good construction practice. See also CIRIA Report 97; WA Excavation code of practice	Typed
EXQ057	Who designs the temporary support of services (Party)	Temporary works designer, as part of this brief	Manual input	Typed
EXQ058	Are there overhead services or height restrictions affecting installation plant	No	Good construction practice. See also Work Health and Safety (General) Regulations 2022 (WA); WA Excavation code of practice	Typed
EXQ059	Are third party asset owner approvals needed, and who obtains them (Describe)	Water main owner approval, obtained by contractor	Manual input	Typed
EXQ205	Asset owners' approval zones: for each service with a zone entered, the zone and its document, whether the excavation or its zone of influence reaches it, and the approval status	Not provided	Project specification	Optional, not given

ID	Question	Response	Source	Status
EXQ207	Third party assets whose owners review the brief: the asset, the owner, the review and its status, and the owner's limits on the works	Not provided	Manual input	Optional, not given

Table A.9 G. Interface with the permanent works

ID	Question	Response	Source	Status
EXQ060	Permanent works to be built within the excavation (Describe)	DN900 steel pipe on granular bedding	Manual input	Typed
EXQ061	Has the permanent works designer been consulted on the temporary works concept	Yes	TWfAU2020:01; BS 5975-1	Typed
EXQ062	Does the support bear on, connect to or apply load to any permanent works	No	TWfAU2020:01; BS 5975-1	Typed
EXQ143	What becomes of the support at completion	Removed in full	Good construction practice. See also TWfAU2020:01; BS 5975-1	Typed
EXQ063	Will any part of the support be left in place	No	Good construction practice	Derived
EXQ065	Does the permanent works design assume a particular construction or backfill sequence	No	Good construction practice	Typed
EXQ066	Must pipes, structures or penetrations pass through the line of the support	No	Good construction practice	Typed

Table A.10 H. Sequence, stages and hold points

ID	Question	Response	Source	Status
EXQ070	Excavation stages (Describe)	1. Excavate to the first frame level and install the top frame from outside the excavation (to RL 10.90), support partial 2. Excavate to the base, installing the second frame as the dig passes its level (to RL 8.60), support installed [Inspection before entry] 3. Lay the pipe and backfill in 300 mm layers to the lower frame (to RL 8.60), support installed [Permit to continue] 4. Raise the frames as the backfill rises and remove them at the surface (to RL 8.60), support removed [Permit to strike]	TWfAU2020:01; BS 5975-1	Derived
EXQ155	Hold points the site expects (List)	Inspection before entry at stage 2 (Frames installed and pinned, base inspected), released by Temporary Works Coordinator; Permit to continue at stage 3 (Compaction test results before the lower frame is lifted), released by Contractor site team; Permit to strike at stage 4, released by Temporary Works Coordinator	Good construction practice. See also TWfAU2020:01	Derived
EXQ163	Sensitivities: features where a small departure invalidates the design (List)	Not provided	Good construction practice. See also TWfAU2020:01	Optional, not given

ID	Question	Response	Source	Status
EXQ007	Planned period the excavation will remain open (weeks)	6	Good construction practice. See also AS 4678; CIRIA C760	Derived
EXQ153	Will the open period span a wet season	No	Good construction practice. See also AS 1726; AS 4678	Derived
EXQ161	Design life of the temporary works, including any period left in place (Describe)	6 weeks open; nothing left in place	Good construction practice. See also TWfAU2020:01	Typed
EXQ072	Equipment available on site or from a named hire branch that the design should use where it can, such as shoring stock and sizes (Describe)	Hire supplier to be confirmed	Manual input	Typed
EXQ073	Are there vibration or noise limits that affect installation	No	Good construction practice. See also DIN 4150-3; BS 7385-2; AS 2187.2; BS 5228-2	Typed
EXQ074	Other installation constraints, for example access width, headroom, working hours (Describe)	Access from the north side only	Manual input	Typed
EXQ075	Are there levels or positions where props or walers would clash with the permanent works, lifting or pipe laying (Describe)	Keep a clear zone 1.5 m above the base for pipe laying	Good construction practice	Typed
EXQ076	Backfill sequence and the stage at which support is removed (Describe)	Backfill in 300 mm layers, frames raised as the backfill rises	TWfAU2020:01; BS 5975-1	Typed
EXQ077	Removal method and any risk that extraction affects the completed works (Describe)	Frames lifted by the excavator after the backfill reaches the lower frame	Good construction practice	Typed
EXQ078	Access and egress for workers into the excavation (Select all that apply)	Ladder secured and extending above the edge	Work Health and Safety (General) Regulations 2022 (WA); WA Excavation code of practice	Typed
EXQ185	Greatest distance a worker in the excavation would travel to a means of egress (m)	10	Good construction practice. See also Work Health and Safety (General) Regulations 2022 (WA); WA Excavation code of practice	Typed
EXQ079	Edge protection arrangement (Select all that apply)	Rigid barrier or handrail at the set back	Good construction practice. See also Work Health and Safety (General) Regulations 2022 (WA); WA Excavation code of practice	Typed
EXQ080	Is there a risk of plant or lifted loads striking props or walers	No	Good construction practice	Typed
EXQ201	How the formation is protected while the excavation is open, for example blinding, a sump and the time allowed before blinding	Pipe bedding placed on the day the base is reached; no base left open overnight	Good construction practice. See also BS 5975-1	Typed

ID	Question	Response	Source	Status
EXQ202	Compaction plant used for the backfill near the support, and at what stage	Plate compactor in 300 mm layers as the frames are raised; no vibratory roller within 2 m of the frames	Good construction practice. See also BS 5975-1	Typed
EXQ203	Arrangements if work is suspended with the excavation open	Trench fenced and covered at the end of each shift; inspection before entry when work resumes	Good construction practice. See also BS 5975-1	Typed
EXQ122	How will design changes be handled if site conditions differ from the brief (Describe)	Designer to respond within 2 working days; changes go through the full design process	Good construction practice. See also TWfAU2020:01; BS 5975-1	Typed

Table A.11 H2. Public safety and environment

ID	Question	Response	Source	Status
EXQ154	Could failure or the works affect the public or third parties beyond the site boundary	No	Good construction practice. See also TWfAU2020:01	Typed
EXQ166	Environmental matters that bear on the method (Select all that apply)	None identified	Good construction practice	Typed

Table A.12 I. Performance criteria, standards and categorisation

ID	Question	Response	Source	Status
EXQ090	Deflection or movement limits for the support, with their source (mm and source)	25 mm at the top of the support, from the contractor	Good construction practice. See also AS 4678; CIRIA C760	Typed
EXQ091	Client or project specifications that apply to temporary works (List)	Project specification section on temporary works	Project specification	Typed
EXQ092	Standards the design is to comply with (List)	AS 4678, AS 4100, AS/NZS 1170 series	Project specification	Typed
EXQ197	Calculation basis	Limit state design to the standards listed (AS 4678, AS 4100, AS/NZS 1170 series), unless the project specification states otherwise	Good construction practice. See also AS/NZS 1170 series	Derived
EXQ206	Structure classification of the temporary retaining structure under AS 4678, and the reason	Not provided	AS 4678	Optional, not given
EXQ093	Risk categories: consequence of failure, design complexity and execution (Categories)	CFR2, DCR2, ER2	TWfAU2020:01	Derived
EXQ094	Design checking party and organisation (Party)	Design checker, Example Checking Engineers	TWfAU2020:01	Derived
EXQ095	Is the checker independent of the designer to the level the design complexity category requires	Yes	TWfAU2020:01	Derived
EXQ162	Is the design split between more than one designing party	No	TWfAU2020:01	Derived
EXQ168	Who holds the single holistic check of the whole scheme (Party)	Not provided	TWfAU2020:01	Optional, not given
EXQ186	Check category under the TWfAU procedural control guideline, and the checker independence it sets (Category)	Check category 2. Checked by an individual not involved in the design and not consulted by the designer.	TWfAU Procedural Control GPG	Derived

ID	Question	Response	Source	Status
EXQ194	Checking or certification the contract or client requires beyond the category	Not provided	Project specification	Optional, not given

Table A.13 J. Deliverables, monitoring and inspection

ID	Question	Response	Source	Status
EXQ179	Design statement responding to this brief required	Yes	TWfAU2020:01	Derived
EXQ100	Design drawings required	Yes	TWfAU2020:01; BS 5975-1	Derived
EXQ180	Structural system diagram required	Yes	TWfAU2020:01	Derived
EXQ101	Design calculations required	Yes	TWfAU2020:01; BS 5975-1	Derived
EXQ102	Design certificate required	Yes	TWfAU2020:01; BS 5975-1	Derived
EXQ103	Design check by a party outside the design team required	Yes	TWfAU2020:01	Derived
EXQ104	Installation, staged excavation and removal sequence drawings required	Yes	Good construction practice. See also TWfAU2020:01; BS 5975-1	Derived
EXQ181	Specification with inspection and maintenance requirements required	Yes	TWfAU2020:01	Derived
EXQ105	Designer safety in design risk assessment required	Yes	Work Health and Safety (General) Regulations 2022 (WA); WA Excavation code of practice	Derived
EXQ106	Inspection and test requirements, including hold points, required	Yes	Good construction practice. See also TWfAU2020:01; BS 5975-1	Derived
EXQ107	Monitoring plan with trigger levels and response actions required	Yes	Good construction practice. See also AS 4678; CIRIA C760	Derived
EXQ108	Designer site attendance at critical stages required	No	Good construction practice. See also TWfAU2020:01	Derived
EXQ182	Record of hazard elimination and risk reduction during design required	Yes	TWfAU2020:01	Derived
EXQ183	Peer review record required	No	TWfAU2020:01	Derived
EXQ109	Who installs, reads and reviews the monitoring (Parties)	Surveyor installs and reads, site engineer reviews against triggers	Manual input	Typed
EXQ164	Inspection frequency while the excavation is open	Daily before entry and after rain or ground disturbance	Work Health and Safety (General) Regulations 2022 (WA); WA Excavation code of practice	Typed
EXQ165	Competent person who inspects	Site supervisor	Work Health and Safety (General) Regulations 2022 (WA); WA Excavation code of practice	Typed

ID	Question	Response	Source	Status
EXQ111	Document format, numbering and review turnaround periods (Describe)	PDF through document control, 5 working day review	Manual input	Typed
EXQ208	Native drawing files and the digital model or common data environment requirements, where the project has them (Describe)	Not provided	Project specification	Optional, not given

Appendix B Requirements of the designer

The requirements below follow the TWfAU guide and are scaled for design complexity DCR2.

1. Confirm receipt of this brief and raise any query or additional information requirement in writing before commencing design.
2. Provide a design statement responding to each section of this brief, confirming the site specific information and performance requirements adopted and stating the technical basis of the design.
3. Carry out the concept design activities for design complexity DCR2: Work up and record initial concepts; Review the concepts with the site team and shortlist them; Select the preferred concept; Sign off the chosen concept with the permanent works designer; Sign off the chosen concept with the site team.
4. Provide a structural system diagram at the start of the design documents showing where loads are applied, the load paths to the ground, fixity and continuity assumptions, how stability is achieved, any reliance on permanent works or existing fabric, key assumptions such as barriers and dewatering levels, foundation characteristics and any critical sequence.
5. State in the design output every assumption made where the brief is silent or an item is open, including every geotechnical parameter adopted and its basis against Section 3, and list them so they can be verified on site.
6. Provide calculations that justify every component and connection for the most onerous case, including handling, staged and interim conditions, with the codes and any software stated and order of magnitude hand checks where computer calculations are used.
7. Provide drawings that communicate the general arrangement and all details without ambiguity, state the acceptable tolerances, and highlight significant residual risks such as ground conditions, water levels, sequences and clearances.
8. Show on the drawings the surcharge limits, plant exclusion zones, spoil set backs and any clear zones assumed.
9. Provide an installation, staged excavation, backfill and removal sequence that matches Section 5, showing the hold points, or state the departures.
10. Provide a specification, or notes on the drawings for a simple scheme, covering the workmanship requirements of each significant component and the inspection and maintenance regime while the works are in place.
11. State the inspection and monitoring regime required, with trigger and alarm levels and the action to take at each level.
12. Confirm or amend the design conditions, sensitivities and hold points anticipated in Section 5, and identify the assumptions that must be verified on site before the works are loaded or entered.
13. Record the hazard elimination and risk reduction carried out during design, given the constraints set by the permanent works and the site.
14. Communicate the significant residual risks and the sensitivities of the design to the site team in the drawings, specification and design statement, so the safe system of work can control them.
15. Where the temporary works interact with the permanent works, obtain confirmation from the permanent works designer that the temporary works as designed suit the permanent works.
16. Plan the removal in the design: any mechanism needed to release load safely, lifting and handling arrangements that differ from installation, the conformance criteria the permanent works must meet before removal (the backfill and the permanent works that replace the support), and any element left in place for

others with its service life and the records to hand over.

17. Write the residual risks and the limits of the design on the drawings so they transfer to the permit, the safe work method statement and the site team, and state that the temporary works are not to be altered or used outside their intended purpose without the coordinator's written acceptance and, where the design is affected, a revised design and check.
18. Provide the deliverables marked in Section 6 in the format stated, with a design certificate and QA records under the design organisation's procedures.
19. Respond to changes and queries through the full design process; changes are not to be authorised by email or supplementary sketch.
20. Assist the site team to release hold points, and advise the author immediately if site conditions reported during construction differ from the basis of the design.
21. State in the design statement the edition of each document the design is to.

Concept design activities for DCR2

- Work up and record initial concepts.
- Review the concepts with the site team and shortlist them.
- Select the preferred concept.
- Sign off the chosen concept with the permanent works designer.
- Sign off the chosen concept with the site team.

Appendix C Return brief and the designer's statements

This is the single return schedule for the brief. The designer confirms each item or states what is queried, and returns this table with the design statement. Items marked minimum are the TWfAU guide's minimum content of a brief.

Table C.1 Return brief

The items of the TWfAU brief template, where this brief covers each, and a column for the designer's response.

No	Item	Minimum	Covered in this brief	Designer response
1	Project	Yes	Cover page	
2	Brief reference	Yes	Cover page	
3	Description	Yes	Section 2 (the works) and Section 3 (the design basis data), with the drawings in Part 2	
4	Discipline		Cover page (excavation and trench support)	
5	Scope		Section 2 (scope of the design); Sections 3 and 4	
6	Potential to impact public safety		Section 4 (public safety and the environment)	
7	Risk and uncertainty assessment	Yes	Categorisation with reasoning in Section 6; the ground and its parameters in Section 3; sensitivities in Section 5	
8	Constraints and hazards		Sections 3 (loads, structures and services) and 4	
9	Preferred strategy, construction methodology, staging, preferred and non preferred solutions		Sections 2 and 5 with the stage sketches in Part 2; concept screening in Section 4	
10	Design life	Yes	Section 4 (EXQ161, EXQ007, EXQ143)	

No	Item	Minimum	Covered in this brief	Designer response
11	Requiring lifting		Section 4 (EXQ147) and the plant register in Section 3	
12	Proposed method of decommission or removal		Sections 4 and 5 (EXQ143, EXQ076, EXQ077)	
13	Proposed loading	Yes	Section 3: plant register, spoil and other surcharges, structures; indicative figures from the plant data in Appendix E	
14	Interfaces	Yes	Sections 3 and 4; split design in Section 2	
15	Program dates		Design required by date on the cover page and the brief at a glance, where given; the programme dates in Section 2 where the author includes them	
16	Specification and design standards		Section 6; each document is cited by reference where the brief names it	
17	Functional requirements	Yes	Sections 3, 4, 5 and 6	
18	Design deliverables		Sections 6 and 9, and the requirements of the designer in Appendix B	
19	Sketch	Yes	Part 2: generated sections, plan, support details and stage sketches on A3 sheets; attached markups	
20	Environmental		Section 4 (public safety and the environment)	
21	Risk		Categorisation in Section 6, open items in Section 8 and concept screening in Section 4	

Table C.2 Drawing completeness review at return

The coordinator reviews the returned design against each item before it is accepted, and marks it met, not met, or not applicable with the reason.

Item	Reviewer's finding
Drawing index complete: general arrangement, sections, details, notes and interfaces with other works	
Issued for construction, and the revision on the drawings matches the certificate	
Assumptions stated, including every item by others and who those others are	
Assumed ground conditions or the assumed capacity of the supporting structure stated and verified	
Limits of the design stated: loads, rate of rise where concrete is placed, wind speed, jack extensions, tie spacing	
Residual risks written on the drawings and the verification testing named (ground, anchors, concrete strength)	
Load limits and exclusion zones shown where the site has to control them	

Appendix D Categorisation, responsibilities and permits

Table D.1 Temporary works categories, stated and proposed

The categories stated by the author, the categories the tool proposes from the brief data, and the author's reasoning. The categories set the checking, the deliverables and the inspections below. The check category is that of the TWfAU Procedural Control GPG.

Category	Stated	Proposed from the data	Author's reasoning
Consequence of failure	CFR2. Potentially major impact, including injury, fatality or significant loss, but the failure would not set off a further chain of major incidents.	CFR2. Workers enter an excavation 3.80 m deep, so collapse could injure or kill; a live service crosses or lies within the excavation.	Workers enter a 3.80 m deep trench, so collapse could injure or kill; a valve chamber stands 6 m away.
Design complexity	DCR2. More complex or involved designs where the consequence category is CFR2 or lower; also any simpler scheme where the consequence category is CFR2, or where it interacts with an adjacent but separately managed scheme.	DCR2. A catalogue box or frame used within its rated depth and ground with nothing adjacent; raised because the consequence category is CFR2.	Catalogue frames within their rated depth, raised to DCR2 because the consequence category is CFR2.
Execution risk	ER2. Conventional structures, where the consequence category is CFR2 or below.	ER2. A conventional support structure.	A conventional support structure.
Check category	2. An involved design that needs more than straightforward analysis, or one where the loads or the ground data need considerable interpretation.	2. DCR2 calls for this independence: checked by an individual not involved in the design and not consulted by the designer.	Matches the checker independence DCR2 calls for.

Could failure trigger a secondary or chain reaction of major incidents: No. Design beyond normal codes and practice: No.

Table D.2 Design checking

Who checks the design, and whether the checker is as independent as the design complexity category requires.

Checking required	Checked by an individual not involved in the design and not consulted by the designer.
Check category stated	Check category 2. Gives the independence DCR2 calls for.
Checking party	Design checker, Example Checking Engineers
Relationship to the designer	Different organisation, not involved in the design. Meets the independence required.
Parts designed by different parties	Whole scheme: Temporary works designer
Holistic check of the whole scheme	Not provided

Table D.3 Design deliverables

What the designer is to provide for design complexity DCR2.

Deliverable	Required	Note
Design sketches or drawings: general arrangement, sections, details, notes and the interfaces with other works	Yes	Issued for construction, with the revision matching the certificate
Design calculations	Yes	Every component and connection for the most onerous case, with hand checks of computer output
Design report: inputs, methodology, standards, risks considered and residual, calculations and records	Yes	Required from the more complex design category upward
Design certificate	Yes	Signed by the designer
Design check certificate	Yes	Checked by an individual not involved in the design and not consulted by the designer.

Deliverable	Required	Note
Safety in design register, with the residual risks written on the drawings	Yes	A workshop with the site team, or a desktop review for a simple scheme with common risks
Construction methodology and sequence drawings	Yes	Where the work is staged, moved or altered in use
Inspection and test plan with the hold points and the permit stages	Yes	Feeds the pre installation checklist, the permit to load, the routine inspection schedule and the permit to unload and dismantle
List of the reference documents used in the design, with their revisions	Yes	Good construction practice (see DIT PC-CN4)
List of departures from the brief, the standards or the permanent works, each with its status	Yes	Good construction practice (see DIT PC-CN4); a departure is accepted by the coordinator before construction
Job specific risk assessments for erection, use, maintenance and dismantling	Yes	Good construction practice (see DIT PC-CN4); prepared with the site team
Instrumentation requirements: what is measured, where, how often, and the readings at which work stops	No	Good construction practice (see DIT PC-CN4); also wherever the design relies on readings
List of the approvals obtained and those still required, with who obtains each	Yes	Good construction practice (see DIT PC-CN4)
Record of the construction team's acceptance of the design documentation	Yes	Good construction practice (see DIT PC-CN4); before the permit to load
Statement of how the heightened risk of failure has been treated in the design	Yes	Good construction practice (see DIT PC-CN4); for consequence categories CFR2 and CFR3

Table D.4 Installation inspections before the permit to load

Who inspects the installed works for design complexity DCR2.

Inspection	Required	Note
Installation inspected and the permit signed by the package owner and the supervisor	Yes	Using the permit and the specific checklist for the type of temporary works
Installation inspected by the temporary works inspector before the permit to load	Yes	For the simple and more complex design categories
Installation inspected by the designer or the proof engineer before the permit to load	No	For the complex and abnormal design categories, and wherever the brief names the designer's attendance

Table D.5 Party register

Every party of the matrix below, with the key it uses.

Key	Party	Organisation	Named person
Site	Contractor site team		
TWC	Temporary Works Coordinator	Example Contractor	A. Sample
PO	Package owner		
TWD	Temporary works designer		
Chk	Design checker	Example Checking Engineers	
TWI	Temporary works inspector		
Geo	Geotechnical consultant		
PWD	Permanent works designer		
Sub	Subcontractor or installer		
Sup	Equipment supplier		
Surv	Surveyor or monitoring provider		
Clt	Client or asset owner		

Table D.6 Responsibility matrix

Each activity with the party responsible (R), accountable (A), consulted (C) and informed (I), by the keys of the register above, with the notes. Activities shaded yellow have a gap in the allocation.

Activity	Phase	R	A	C	I
Supply existing geotechnical information	Information	Site	TWC	Geo	TWD
Carry out further investigation if requested. EXQ028: party supplying further geotechnical information (EXQ028 names Contractor site team, Geotechnical consultant)	Information	Site	TWC	TWD, Geo	
Supply survey and service location information	Information	Site	TWC	Surv	TWD
Define plant, surcharges and working positions	Information	Site	TWC	PO, TWD, Sub	
Prepare the design brief	Brief	Site	TWC	PO, TWD, Geo, PWD	
Review, approve and issue the design brief	Brief	TWC	Site		TWD, Chk
Concept design and option selection	Design	TWD	TWC	Site, Geo, Sup	
Detailed design of the support	Design	TWD	TWC	Geo, PWD, Sup	Site
Design of temporary support to services. EXQ056: services need support (EXQ057 names Temporary works designer)	Design	TWD	Site		
Design check	Check	Chk	TWC	TWD	
Review of interfaces with permanent works	Check	PWD	TWC	Site, TWD	
Obtain third party asset owner approvals. EXQ059: approvals to be obtained (EXQ059 names Client or asset owner, Contractor site team)	Approvals	Clt	Site	TWD	
Supply support equipment or materials	Installation	Sup	Site		
Install the support	Installation	Sub	Site	TWD, TWI, Sup	
Inspect before use and issue permit to load or enter	Operation	TWC	Site	PO, TWI	Sub
Routine inspections while open	Operation	Site	TWC	PO, TWI, Sub	
Install monitoring. EXQ107: monitoring required (EXQ109 names Surveyor or monitoring provider, Contractor site team)	Operation	Surv	Site	TWD	
Take and review monitoring readings. EXQ107: monitoring required (EXQ109 names Surveyor or monitoring provider, Contractor site team)	Operation	Surv	Site		TWD
Respond to a trigger level being exceeded. EXQ107: monitoring required, response rests with the site team	Operation	Site	TWC	TWD, Geo	
Manage design changes when site conditions differ	Operation	TWD	TWC	Site, Chk	
Issue permit to remove	Removal	TWC	Site	PO	Sub
Remove the support	Removal	Sub	Site	TWD, TWI	
Backfill and compaction	Removal	Site	TWC		
As built records and close out	Close out	Site	TWC		TWD

Activities that do not apply: Design of dewatering (EXQ160: groundwater outside the depth of influence); Holistic check of a split design (EXQ162: one party designs the whole scheme); Lift planning for the support (EXQ147: no crane handles the support); Verify

ground treatment before excavation (EXQ159: no ground treatment in the scheme); Geotechnical inspection of exposed faces before entry (EXQ148: no rock within the excavation depth); Control the load state of adjacent structures (EXQ152: no load state condition on an adjacent structure); Operate and maintain dewatering (EXQ160: groundwater outside the depth of influence).

Table D.7 Permit stages the design is to support

The site's permits from installation to close out, and what each needs from the design. The permit to load and the permit to unload follow the TWfAU Procedural Control GPG.

Stage	What the design provides for it
Pre installation checklist	Design signed off and current, competency verified, plant interaction controlled, emergency arrangements in place, founding verified
Permit to load	Installation inspected against the design by the parties the category requires; the designer's and the permanent works designer's approvals in place where required; the residual risks and the load limits communicated and marked
Routine inspection and maintenance schedule	Element, what is inspected, the frequency, who inspects, the last inspection and the issues found; the frequency rises for elements exposed for a long time
Permit to alter	No deviation from the design without the coordinator's written acceptance; the design revisited where the change affects it
Permit to unload and dismantle	Whether removing the temporary works loads another structure, and that structure complete and able to carry it; the release mechanism, the lifting arrangement, the conformance criteria of the permanent works and the laydown area confirmed before removal
Close out	Records of the inspections, the changes and any element left in place for others handed over

Change management. The temporary works are not to be used outside their intended purpose or altered without the coordinator's written acceptance through the permit. Where the surrounding conditions change (ground removed beside a footing, a load added, a tie removed), the coordinator is consulted on whether further measures are needed; where the change affects the design, the design process is revisited and the certificate reissued.

Appendix E Indicative arithmetic and supporting tables

Table E.1 What each parameter governs

Why the design needs each parameter tabulated in Section 3, and the document that deals with it.

Parameter	What it governs	Reference
Bulk unit weight	Weight of the ground per unit volume. Every earth pressure and surcharge calculation starts from it.	AS 1726 (description and classification); AS 4678 (soil parameters for retaining design)
Effective cohesion	Drained strength intercept. Often zero for clean sands, which is still a stated value.	AS 4678 (drained strength parameters)
Effective friction angle	Drained strength angle that governs active and passive pressures and batter stability.	AS 4678 (drained strength parameters)
Dilation angle	Used in numerical analysis of embedded walls. Commonly assumed; the assumption should be stated.	CIRIA C760 (parameters for numerical analysis)
Stiffness modulus	Controls predicted ground movement. Movement limits cannot be checked without it.	AS 4678 (serviceability); CIRIA C760 (stiffness for movement prediction)
Poisson's ratio	Companion to the stiffness modulus in movement prediction.	CIRIA C760 (stiffness for movement prediction)
At rest earth pressure coefficient	Initial stress state for embedded wall analysis.	AS 4678 (earth pressure at rest); CIRIA C760
Permeability	Needed for dewatering, seepage and base stability.	AS 1726 (in situ and laboratory testing); AS 4678 (groundwater)

Table E.2 Sources of the plant data

The configuration of each item in the plant register of Section 3, and the manufacturer's or supplier's published document behind its figures, with its date.

Plant	Configuration	Document the published figures come from
Caterpillar 320	Reach boom 5.7 m, R2.9 (9'6") stick, 1.19 m ³ Heavy Duty bucket, 600 mm triple grouser shoes, 4.2 t counterweight	320 Hydraulic Excavator Technical Specifications, AEXQ3763-01 (12-2025), replaces AEXQ3763-00; Build Number: 07H (Aus-NZ), https://s7d2.scene7.com/is/content/Caterpillar/CM20240927-7135e-30612 , accessed 2026-09-27
Caterpillar 730	Articulated dump truck at rated payload	730 Articulated Truck Technical Specifications, AEXQ3874-00 (12-2025), Build Number: 05A (Aus-NZ, Europe, Japan, N Am); Caterpillar-hosted PDF, https://s7d2.scene7.com/is/content/Caterpillar/CM20251208-1f229-5ccc4 , accessed 2026-09-27

Table E.3 Indicative figures from the published plant data

Simple arithmetic on the published data, with the formula shown. They are not a design surcharge: the designer converts the plant data into the surcharge adopted, allowing for position, distribution with depth and dynamic effects, and states it in the design.

Plant	Figure	Value	Formula and inputs
Caterpillar 320	Weight	211.9 kN	$W = m g = 21.6 \text{ t} \times 9.81 \text{ m/s}^2 = 211.9 \text{ kN}$
Caterpillar 320	Ground pressure (published)	44.9 kPa	As published by the manufacturer for reach boom 5.7 m, R2.9 (9'6") stick, 1.19 m ³ Heavy Duty bucket, 600 mm triple grouser shoes, 4.2 t counterweight (320 Hydraulic Excavator Technical Specifications, AEXQ3763-01 (12-2025), replaces AEXQ3763-00; Build Number: 07H (Aus-NZ), https://s7d2.scene7.com/is/content/Caterpillar/CM20240927-7135e-30612 , accessed 2026-09-27).
Caterpillar 320	Average track pressure	48.4 kPa	$p = m g / (2 L b) = 211.9 \text{ kN} / (2 \times 3.65 \text{ m} \times 0.6 \text{ m}) = 48.4 \text{ kPa}$
Caterpillar 320	Load spread over the track footprint	19.5 kPa	$q = m g / (L (s + b)) = 211.9 \text{ kN} / (3.65 \text{ m} \times 2.98 \text{ m}) = 19.5 \text{ kPa}$
Caterpillar 730	Weight	505.3 kN	$W = m g = 51.51 \text{ t} \times 9.81 \text{ m/s}^2 = 505.3 \text{ kN}$
Caterpillar 730	Heaviest axle load	172.8 kN	$17.61 \text{ t} \times 9.81 \text{ m/s}^2 = 172.8 \text{ kN}$ (published loaded axle loads: 17.61, 17.07, 16.84 t)
Caterpillar 730	Load spread over wheelbase by width	24.2 kPa	$q = m g / (\text{wheelbase} \times \text{width}) = 505.3 \text{ kN} / (5.679 \text{ m} \times 3.676 \text{ m}) = 24.2 \text{ kPa}$

Appendix F Answers marked not applicable

No answer was marked not applicable.

Appendix G Documents and attachments

Table G.1 Documents provided with this brief

The documents the designer is to work from, and whether each comes with this brief or within it.

Document	Provided	How it is provided	Comment
Design brief	Yes	Within this brief	
Permanent works drawings	Yes	Provided with the issue of this brief	C 101 rev C and C 102 rev B, issued for construction
Concept or method sketches and markups	Yes	Within this brief	Sections, plan, details and stage sketches generated from the brief data
Existing and permanent utilities	Yes	Provided with the issue of this brief	Service authority plans and potholing record of the water main
Survey	Yes	Provided with the issue of this brief	Feature and level survey of the corridor
Geotechnical information	Yes	Provided with the issue of this brief	Report G 001 with the BH01 log
Methodology and sequencing	Yes	Within this brief	Stages and hold points in Section 10
Traffic plans	N/A	Not provided	No road beside the works
Plant data sheets	Yes	Provided with the issue of this brief	Manufacturer data for the excavator and dump truck
Other	N/A	Not provided	Nothing further

The documents that go with this brief:

- The brief data export from TworkX, including the excavation data, every response with its source, the gap check results and the responsibility matrix.
- The reference drawings listed in Section 2.
- The geotechnical investigation report and survey referred to in Section 3.
- The plant data sheets for the plant in Section 3.
- The drawings of Part 2 as a DXF file for AutoCAD, from the brief's Issue tab.