Building and Construction Authority

Building Control (Amendment) Act 2012 and Regulations 2012:

ERSS – Submission Requirements

Building Engineering Group
Building and Construction Authority
May 2015

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General Definitions

- **Earth Retaining Structure**
  - Any structure, structural system or other means used to maintain the shape of excavation during construction, earth filling or cutting

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Submission Requirement for ERSS

All permanent or temporary building works that involve	Appointments Required	
	Qualified Person (QP)	Accredited Checker (AC)
Excavation/ERSS ≤ 1.5 m** deep	Plan approval is not required	
1.5 m** < Excavation/ERSS ≤ 4 m deep	QP(ST)	AC is not required
4 m < Excavation/ERSS ≤ 6 m deep	QP(ST)	AC
Excavation/ERSS > 6 m deep and not classified as Geotechnical Building Works (GBW): e.g. excavation for sewer manhole associated with pipe diameter of 2 m or less	QP(ST)	AC
Excavation/ERSS > 6 m deep and classified as GBW. E.g. basement excavation.	QP(ST) QP(Geo)	AC AC(Geo)

Notes:
Plan approval is not required for insignificant building works listed on First Schedule of Building Regulation 3A.
** If the structure that retains earth is not constructed of reinforced concrete or steel, then the applicable depth is 1 m instead of 1.5 m.
Planning approval is no longer required for any retaining wall or earth-retaining structure for supporting the face of an excavation made for the purpose of constructing any pile cap, footing, sump, lift pit or trench, provided that the size of these structures does not exceed 10 square meters in area and 2 meters in depth.

Submission requirement for excavation works within a building worksite

All excavations within a building worksite shall be submitted for plan approval except for excavation not deeper than 1.5 m (general excavation) or 2 m (for localise excavation for pile cap, footing, sump, lift pit or trench where the size of pile cap, footing, sump, lift pit or trench does not exceed 10 square metres).

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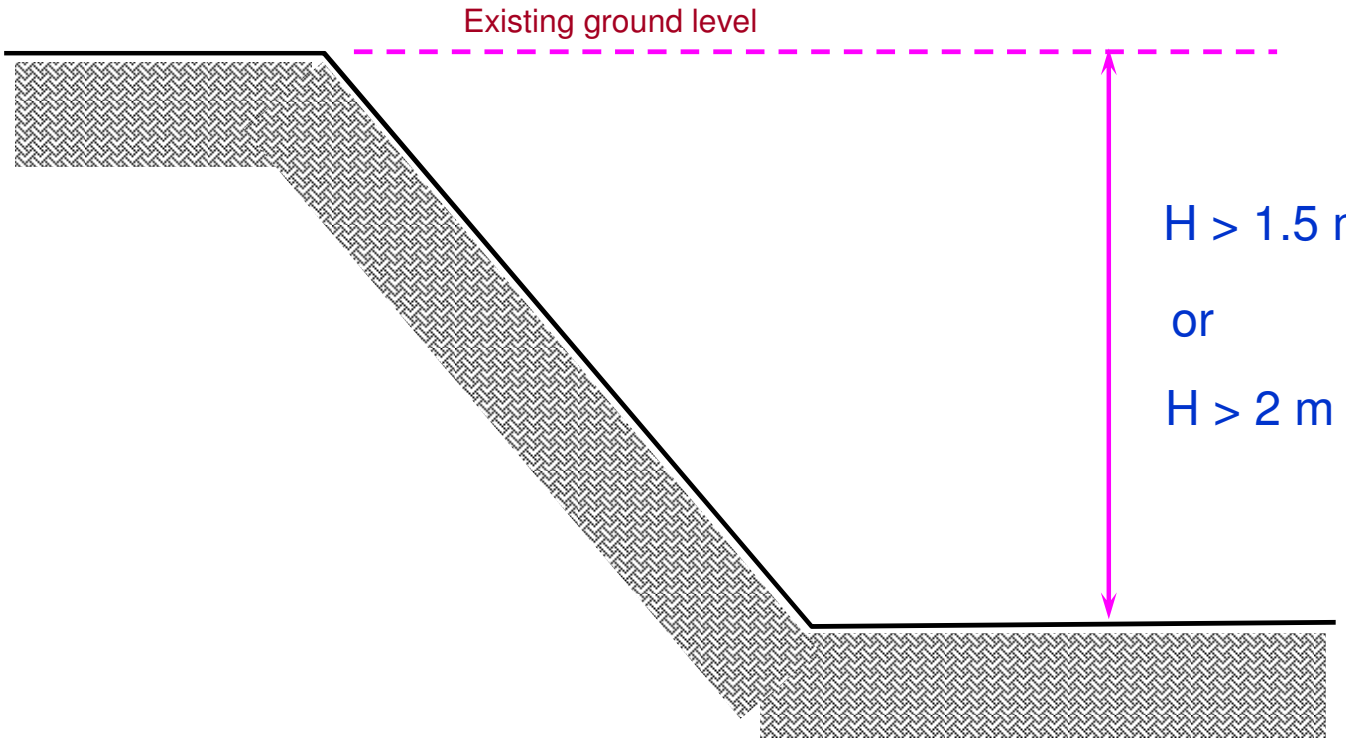
Submission requirement for excavation



Plan submission for approval is required

* Except those exempted in the First Schedule of Building Regulations and not located within a construction site together with other building works

**For pile cap, footing, sump, lift pit or trench, with the size of the pile cap, footing, sump, lift pit or trench does not exceed 10 square metres

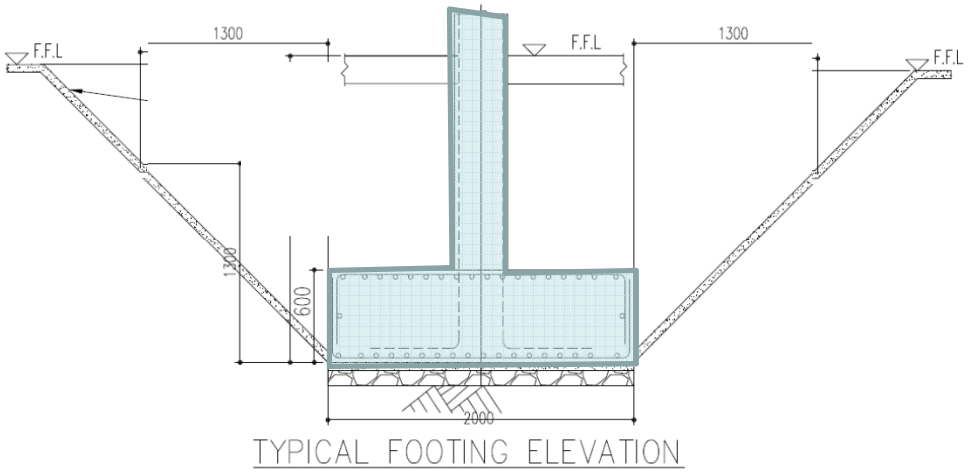
For cases where H exceed 4 m, QP and AC are required for plan submission.
For cases where H exceed 6 m, QP, AC, QP(Geo) and AC(Geo) are required for plan submission.

Examples of localise excavation

CASE 1

Plan area of footing = 6 m^2

Excavation depth = 1.8 m



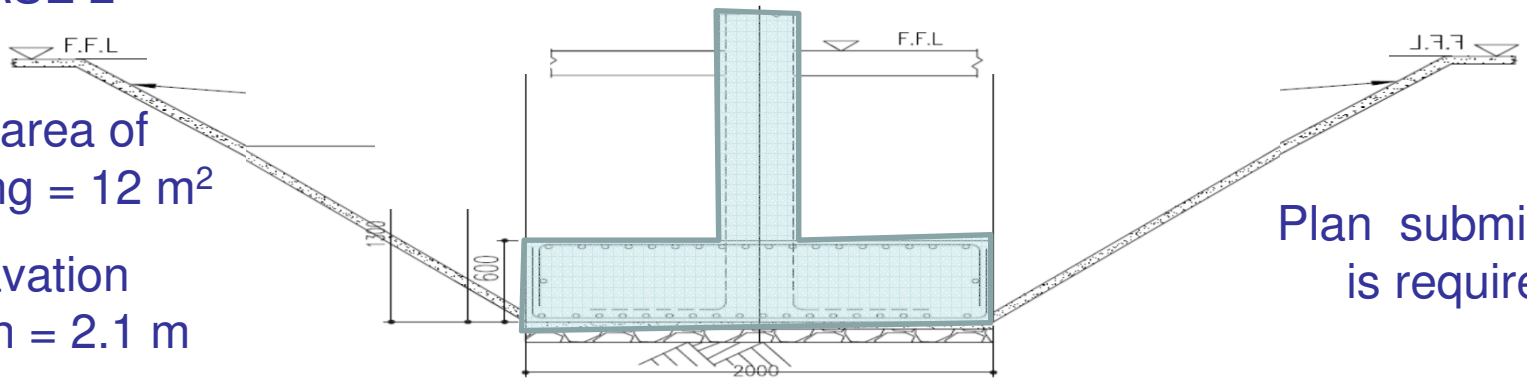
TYPICAL FOOTING ELEVATION

Plan submission is NOT required

CASE 2

Plan area of footing = 12 m^2

Excavation depth = 2.1 m



TYPICAL FOOTING ELEVATION

Plan submission is required

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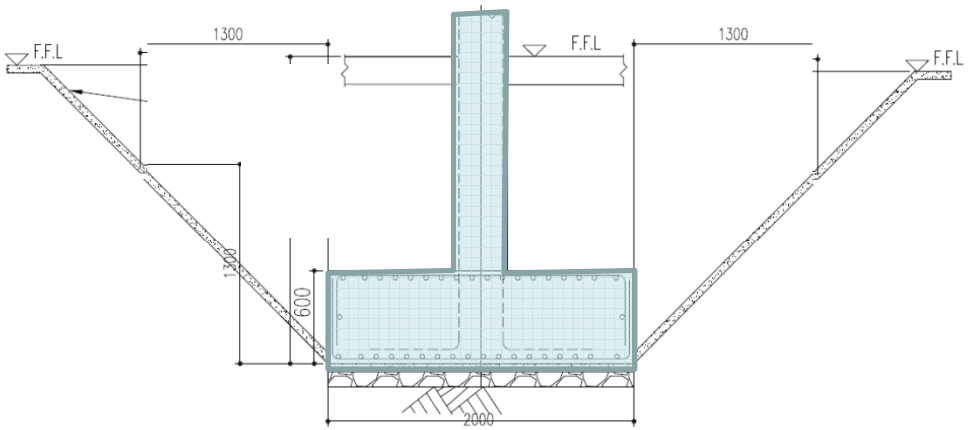
Examples of localise excavation

CASE 3

Plan area of footing = 6 m^2

Excavation depth = 2.1 m



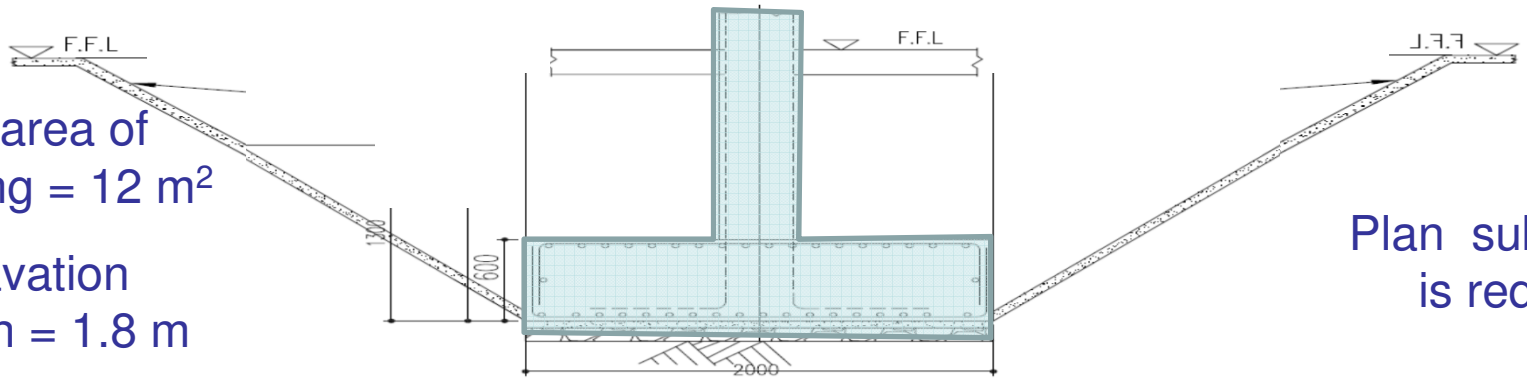
TYPICAL FOOTING ELEVATION

Plan submission is required

CASE 4

Plan area of footing = 12 m^2

Excavation depth = 1.8 m



TYPICAL FOOTING ELEVATION

Plan submission is required

Advisory Note 1/09 on ERSS

Key points

Movement control limit

Table 1: Allowable maximum ERSS wall deflection limits

Wall deflection limits/Zones where x = distance from excavation face; H = excavation depth δ_w = wall deflection	Locations of buildings, structures and critical utilities			
	Zone 1 (x/H < 1)	Zone 2 (1 ≤ x/H ≤ 2)	Zone 3 (x/H > 2)	
			Ground Type A	Ground Type B
Allowable maximum ERSS wall deflection limits (δ_w/H)	0.5%	0.7%	0.7%	1.0%

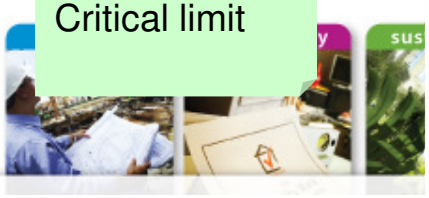
Ground Type A refers to over-consolidated stiff clays and silts, residual soils, and medium to dense sands; and Ground Type B refers to soft clays, silts or organic soils extending to or below formation level (e.g. Kallang Formation) and loose fills.

10 In any case, the allowable wall deflection limits shall also be determined by the prevention of structural damage to neighbouring buildings or structures arising from ground deformations.

Table 2: Control strategies guides for ERSS.

Zone 1	Allowable limits		
	Alert level	Work suspension level	
	70% WSL	Allowable wall deflection limit	
Zones 2 and 3	Allowable limits		
	Check level	Alert level	Work suspension level
	50% WSL	70%WSL	Allowable wall deflection limit

Critical limit



ERSS – Submission Requirements

- **Plans Submission**

  (a) Plans approval is required for ERSS

  - To attach ERSS_Annex A
  - To include site investigation report with PE certification

  (b) Require Permit to commence work

  - to attach ERSS_Annex B
  - Commencement of work: to notify BCA

- **During Construction Stage**

  - To implement ERSS_Annex C and D at site
  - To submit ERSS_Annex E to BCA monthly

Re-used of structural steel material

Engineer to specify specification of steel material on plan and check the condition of steel material at site.

Where re-used structural steel is used, the structural design shall fully consider any imperfections and conditions of such materials

Quality assurance scheme developed for “reused struts” for bracing excavations has been incorporated into the BC1:2012.

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Certification by PE for SI Report

Certification by Professional Engineer For Site Investigation Report

1. I, _____, the Professional Engineer, PE Registration No. _____ certify that the Site Investigation Report

_____ Description and location of project _____

comprising all field and laboratory data, tests and results therein has been carried out by me or under my supervision or direction, and I have verified the accuracy of the information given in the site investigation report, and to the best of my knowledge and belief, all have been prepared in compliance in all respects with the provisions of the Building Control Act and Regulations, relevant Codes of Practice and Standards.

2. I further certify that I have the appropriate qualifications and experience, and I am familiar with the purpose of the investigation for which this Site Investigation Report is prepared in reference to Project Ref. No: _____

3. Total number of pages in the Site Investigation Report is _____.

PE

_____ _____

Professional Engineer for Site Investigation Signature and Stamp

Date

Record Plans (As-built Plans)

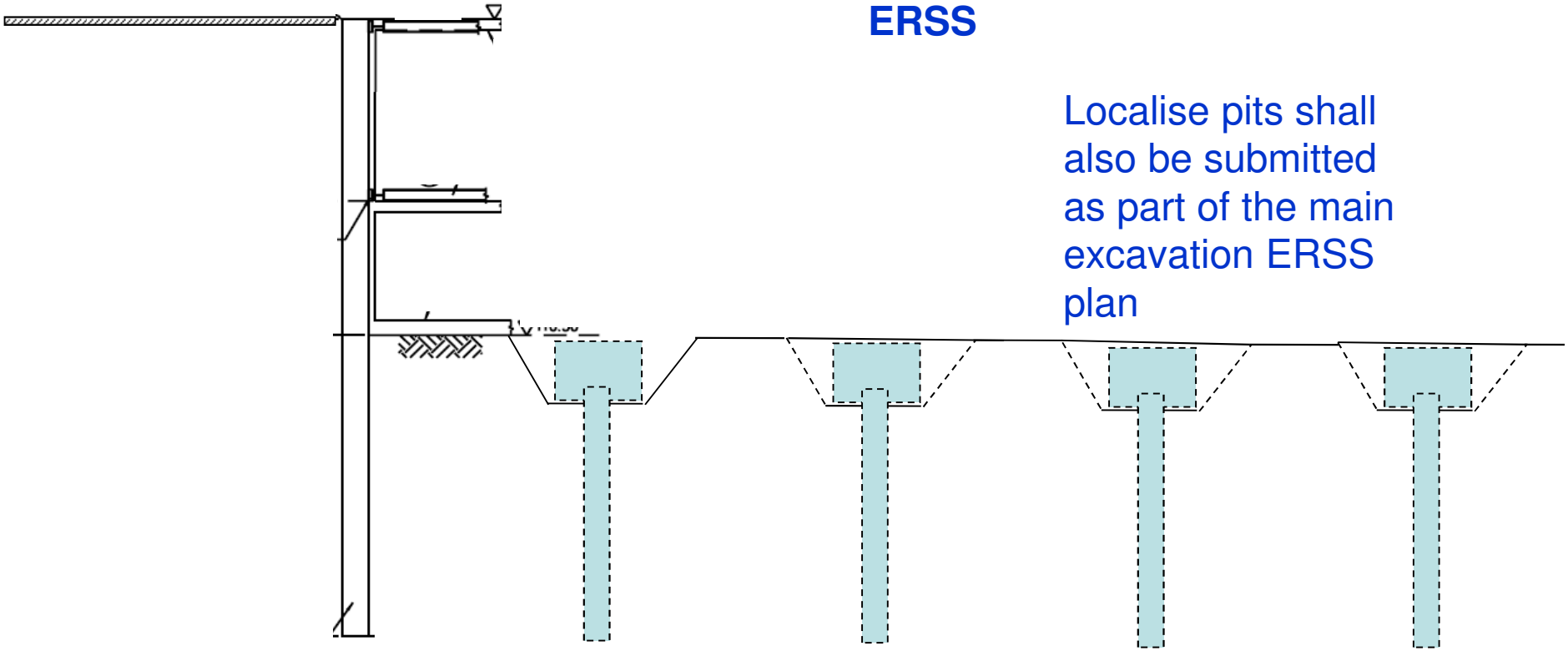
Permanent ERSS structures

Same procedure as per building works to submit:
a) C1, C2 and C3 forms
b) Record piling plans
c) Record structural plans (if any)
Record plans to be endorsed by QPs and ACs of the approved plans

Temporary ERSS

a) Record plans are not required.

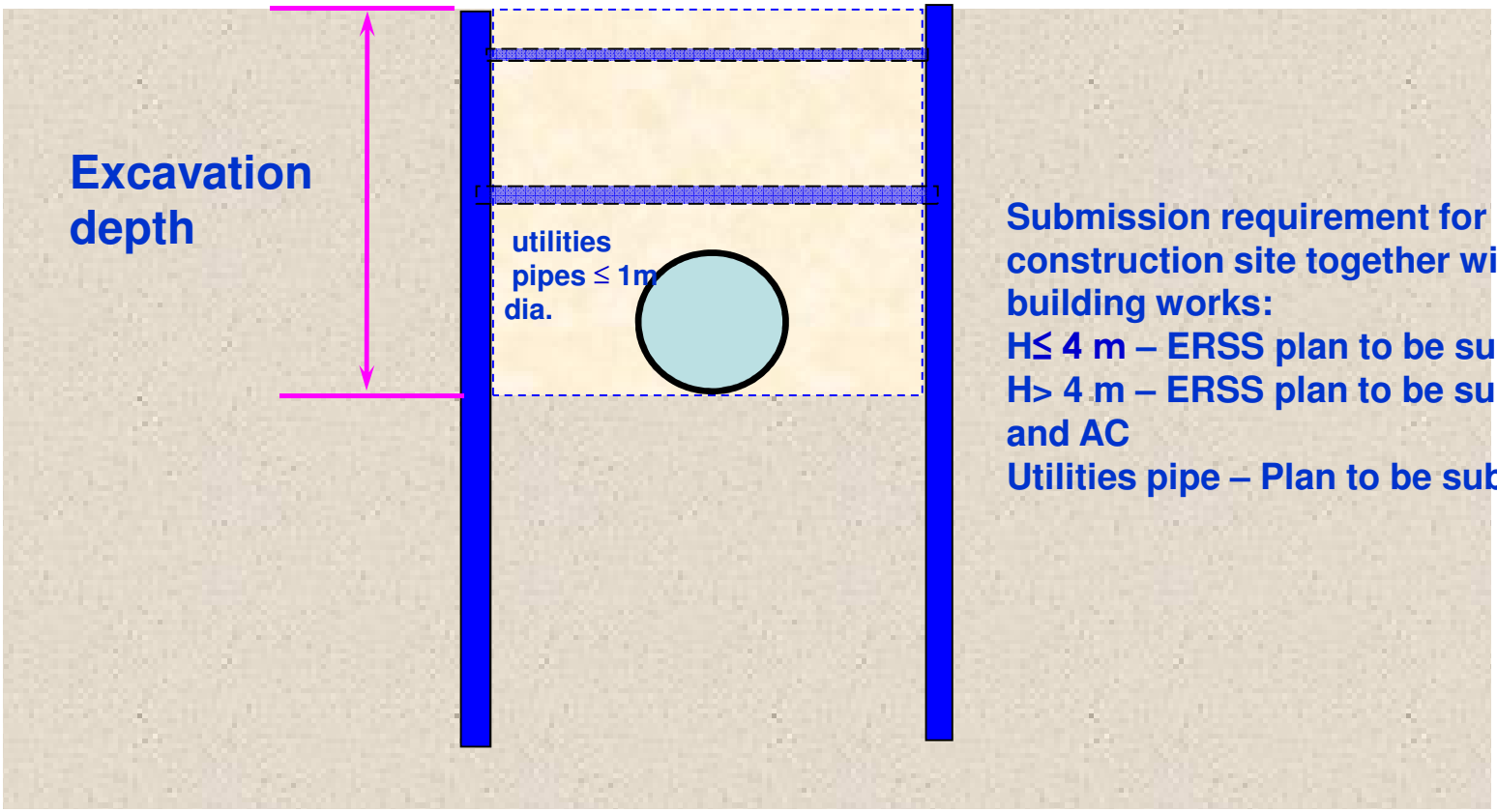
Excavation Works: Basement Construction



ERSS

Localise pits shall also be submitted as part of the main excavation ERSS plan

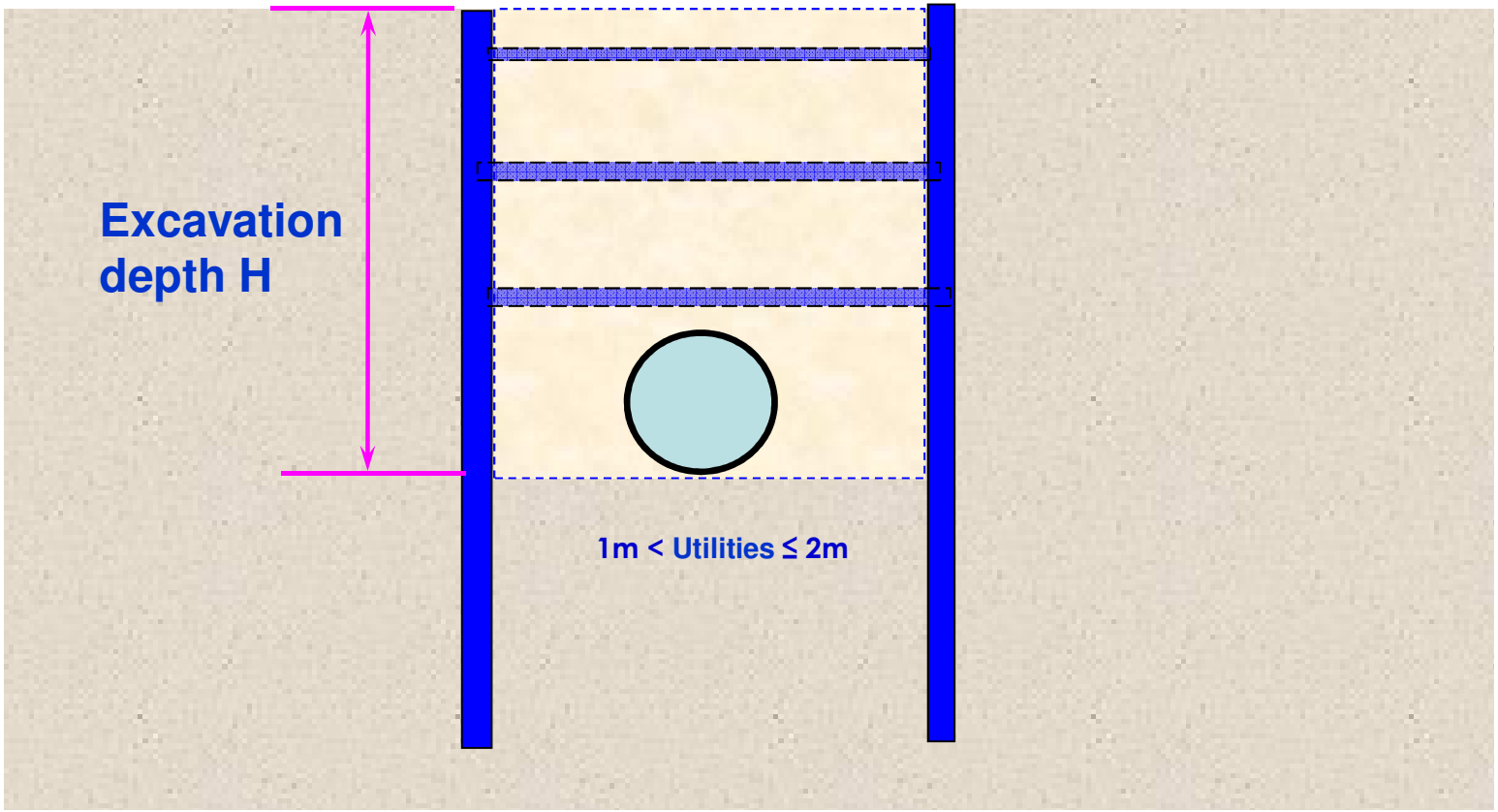
Insignificant Building Works: Utilities such as Sewers, water and gas pipes with diameter of 1m or less



Submission requirement for utilities within construction site together with other building works:
H≤ 4 m – ERSS plan to be submitted by QP
H> 4 m – ERSS plan to be submitted by QP and AC
Utilities pipe – Plan to be submitted by QP

Any trenches for the purpose of laying sewers/utilities (including its associated shaft or manholes) not exceeding 1m in diameter in conjunction with any public sewerage/utilities system is classified as insignificant work which requires no plan submission. This exemption does not apply to cases where the trenches for the purpose of laying sewers/utilities (diameter less than 1m) are within a construction site where the size of trench exceeds 10 square metres or exceeds 2m in depth.

Excavation Works: Utilities pipes (such as sewers, water and gas pipes) with diameter larger than 1 m and not greater than 2 m and its associated shafts or manholes



Submission requirement:

H≤ 4 m – ERSS plan to be submitted by QP

H> 4 m – ERSS plan to be submitted by QP and AC

Utilities pipe – Plan to be submitted by QP and AC

For enquiries:

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