

**Table S1.** Table of Deep Excavation Project Case Studies.

No.	The project name for the new construction project.	Location	Geological Zoning	Excavation stage	Wall thickness (cm)	Wall deep (m)	Final excavation depth (m)
1	Phase 1 of Taishan Building	Taishan District, New Taipei City.	WL	4	60.0	22.5	11.90
2	The new residential and commercial building in Banqiao Xinban section.	Banqiao District, New Taipei City.	B2	7	100.0	35.0	20.00
3	The Chengpin Residential Building.	Shilin District, Taipei City.	TK3	4	50.0	19.0	9.30
4	The new building in Section B of Banqiao Heping.	Banqiao District, New Taipei City.	C	4	60.0	21.5	11.95
5	The new building in Section A of Banqiao Heping.	Banqiao District, New Taipei City.	C	4	60.0	21.0	11.95
6	The Jingshen construction project.	Zhongshan District, Taipei City.	T2	5	70.0	26.0	12.80
7	The new building in Section C of Banqiao Heping.	Banqiao District, New Taipei City.	C	4	60.0	21.0	11.95
8	The building in Section C of Sanchong Fugui.	Sanchong District, New Taipei City.	SC	4	60.0	22.0	11.90
9	Starlight Art Gallery.	Sanchong District, New Taipei City.	SC	7	80.0	36.0	16.10
10	Brownhenge Building.	Da'an District, Taipei City.	TK2	5	60.0	24.0	11.95
11	Dongteng Qianli.	Zhongshan District, Taipei City.	T2	6	80.0	32.0	16.00
12	The building in Guangming section of Xinzhuang.	Xinzhuang District, New Taipei City.	HC	4	60.0	22.0	11.95
13	The building in Section F of Sanchong Fugui.	Sanchong District, New Taipei City.	SC	4	60.0	22.0	11.90
14	Da'an Road Residence.	Da'an District, Taipei City.	TK2	5	70.0	27.5	13.95
15	The building located at land parcel number 782-1 in the Longfeng section.	Xinzhuang District, New Taipei City.	HC	5	70.0	29.0	14.95
16	Feiteng Liren.	Shilin District, Taipei City.	TK3	5	50.0	20.0	10.85
17	Palm Island Residential Building.	Neihu District, Taipei City.	TK3	5	60.0	21.0	11.00

**TableS2.** List of example data for network training and testing.

No	The project name for the new construction project.	The basic information of monitoring pipes.	No	Project name.	Basic information of monitoring pipes.
Training Exapmle			10	Brownhenge Building.	SI-02-stage3
1	Phase 1 of Taishan Building	SI-01-stage3	10	Same as above.	SI-02-stage4
1	Same as above.	SI-01-stage4	10	Same as above.	SI-02-stage5
2	The new residential and commercial building in Banqiao Xinban section.	SI-03-stage3	11	Dongteng Qianli.	SI-03-stage3
2	Same as above.	SI-03-stage4	11	Same as above.	SI-03-stage4
2	Same as above.	SI-03-stage5	11	Same as above.	SI-03-stage5
2	Same as above.	SI-03-stage6	11	Same as above.	SI-03-stage6
2	Same as above.	SI-03-stage7	12	The building in Guangming section of Xinzhuang.	SI-03-stage3
3	The Chengpin Residential Building.	SI-01-stage3	12	Same as above.	SI-03-stage4
3	Same as above.	SI-01-stage4	13	The building in Section F of Sanchong Fugui.	SI-03-stage3
4	The new building in Section B of Banqiao Heping.	SI-01-stage3	13	Same as above.	SI-03-stage4
4	Same as above.	SI-01-stage4	14	Da'an Road Residence.	SI-01-stage3
5	The new building in Section A of Banqiao Heping.	SI-01-stage3	14	Same as above.	SI-01-stage4
5	Same as above.	SI-01-stage4	14	Same as above.	SI-01-stage5
6	The Jingshen construction project.	SI-01-stage3	15	The building located at land parcel number 782-1 in the Longfeng section.	SI-01-stage3
6	Same as above.	SI-01-stage4	15	Same as above.	SI-01-stage4
6	Same as above.	SI-01-stage5	15	Same as above.	SI-01-stage5
7	The new building in Section C of Banqiao Heping.	SI-01-stage3	16	Feiteng Liren.	SI-01-stage3
7	Same as above.	SI-01-stage4	16	Same as above.	SI-01-stage4
8	The building in Section C of Sanchong Fugui.	SI-02-stage3	16	Same as above.	SI-01-stage5
8	Same as above.	SI-02-stage4	17	Palm Island Residential Building.	SI-01-stage3
9	Starlight Art Gallery.	SI-04-stage3	17	Same as above.	SI-01-stage4
9	Same as above.	SI-04-stage4	17	Same as above.	SI-01-stage5
9	Same as above.	SI-04-stage5	Testing Range		
9	Same as above.	SI-04-stage6	10	Brownhenge Building.	SI-04-stage3
9	Same as above.	SI-04-stage7	10	Same as above.	SI-04-stage4
			10	Same as above.	SI-04-stage5