



Ministry of Transport



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Project Management Unit Thang Long

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**Consulting Services for Package 3
Technical Design, Cost Estimation and Tender Assistance
for
Hanoi City Ring Road No.3 Construction Project
Mai Dich – South Thang Long Section**

Work Plan for Geological Survey

August 2015

The Joint Venture of



NIPPON KOEI CO.,LTD.



NIPPON ENGINEERING CONSULTANTS CO.,LTD.



NIPPON KOEI VIETNAM INTERNATIONAL CO., LTD.

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1 GENERAL INFORMATION

1.1 Introduction

The Project road is a part of HRR3 (Western Section) and is planned as viaduct on the median of existing Pham Van Dong Street (primary urban road). The Project road starts at the north side of existing Mai Dich Flyover (KM0+130) and ends at the south side of existing Thang Long Bridge (KM5+493.7).

The Project site is located in Cau Giay and Tu Liem districts at west of urban area in Hanoi city.

1.2 Legal basis

- Construction Law No.50/2014/QH13 dated June 18th 2014 instead of Construction Law No.16/2003/QH11 dated November 26th 2003;
- Highway Transportation Law No.23/2008/QH12 dated November 13th 2008
- Land Law No.45/2013/QH11 dated November 29th 2013
- Environmental Protection Law No.55/2014/QH13 dated June 23th 2014
- Degree No.12/2009/NĐ-CP dated February 12th 2009, issued by Government for management of construction and investment project. And Degree No.83/2009/NĐ-CP dated November 15th 2009 for supplementation and modification some provisions of Degree No. 12/2009/NĐ-CP;
- Degree No.15/2013/NĐ-CP, dated February 6th 2013, issued by Government for quality management of construction work;
- Terms of Reference (TOR) for consulting services of technical design for Hanoi Ring Road No.3 construction project, Mai Dich – South Thang Long section;
- Contract for consulting services of technical design, cost estimation and tender assistance for Hanoi Ring Road No.3 construction project, Mai Dich – South Thang Long section, Contract No 1725/HD-PMUTL, dated June 19th 2015;
- Work Plan of control network approved by the Client;
- Data on control network grade IV (GPS) and secondary control point formulated for technical design.

1.3 Definition

Words and expressions in this work plan shall be referred to the followings:

- "Client" means PMUTL,
- "Consultant" means NK-NE-NKV JV
- "Sub-Consultant" means Service Trading Technology and Construction Joint Stock Company (T&C)
- "Project" means stage 1 of Ring Road No. 3 Construction Project, Mai Dich – South Thanh Long Section,
- "Survey" or "Work" means geological survey in the Project,
- "Consulting Service" means package 3: consulting services of Technical Design, Cost Estimation and Tender Assistance for the Project.

1.4 Location of the Work

- Beginning point is at the North of Mai Dich flyover (Mai Dich flyover on the Ring Road 3 overpass Xuan Thuy street).
- Ending point is at approach of the Thang Long bridge in front of Ciputra residential area
- Length: 5,5 km along the Project road
- Project road alignment: Start from Mai Dich flyover and run along the median of Pham Van Dong street, overpass Hoang Quoc Viet intersection, continuously run straight and cross with the NH69 intersection, go to the North and cross with planned interchange of West Lake – Ba Vi axis road (at the area of Hoa Binh park) and end at the approach of the Thang Long bridge.

1.5 Technical Features of the Project

The technical features of the project are shown in the table below:

Main Technical Features of the Project

No.	Item	Main Features	
		Stage 1: Initial Stage (The Project)	Stage 2: Ultimate Stage
1	Beginning Point (BP)	KM0+130, North side of the existing Mai Dich Flyover	
2	Ending Point (EP)	KM5+493.7, South side of the existing Thang Long Bridge	
3	Road Length	5.364km	
4	Road Classification	Expressway Class A, Grade 100	
5	Design Speed	100km/hr	
6	Nos. of Lane	4 lanes	
7	Road Width	24.0m	
8	Cross Section Elements	0.5m+2.5m+2@3.75m+0.75m+1.5m+0.75m+2@3.75m+2.5m+0.5m - Carriageway : 4@3.75m=15.0m - Outer Safe Line : 2@2.50m=5.0m - Median : 1@1.50m=1.5m - Inner Safe Line : 2@0.75m=1.5m - Concrete Barrier : 2@0.50m=1.0m	
9	Interchange (IC)	1 Interchange <u>South Thang Long IC</u> - IC Type: Half-diamond - Rampway: 1 lane (Width: 7.0m (0.5m+0.5m+3.5m +2.0m+0.5m))	2 ICs (Half-diamond) - Hoang Quoc Viet IC - Co Nhue IC
10	Viaduct	Total Length: 4.803km <u>Superstructure</u> - Typical Type: PC Super T Girder (Span Length: 30-40m) - At Hoang Quoc Viet/Co Khue Intersections: Steel Box Girder (Fiveness Type, Span Arrangement: 63m+78m+63m) <u>Substructure</u> - All Sections: One Column RC Pier <u>Foundation</u> - Standard Section : RC Bored Pile - Narrow Section : Rotation Steel Pile	
11	Pavement Structure	Ultra-thin Bonded Wearing Course, t=2cm (Urban Road: Porous Course, t=4cm)	
12	Auxiliary Works	Retaining wall, drainage system, lighting system, plants, ditch, noise barrier and preparation works for future installation of ITS equipment. Urban Road: Improvement of existing pavement after construction, restoration of existing drainage system and road lighting.	

2 GEOLOGICAL SURVEY PLAN

2.1 General requirements

- To provide the correct data about the status and characteristics of the underlying soil strata and foundation for design alternative of sub-structure;
- The tests shall be carried out in compliance with relevant Vietnamese standards or ASTM standard

2.2 Quality management

- The management of quality of works carried out in accordance with decree issued by the Vietnamese government.
- Team leader of Sub-consultant must fully examine the information on the work diary: date of delivery, the work of each person assigned, schedule completed, to enable effective inspection and control.
- All survey work must proceed from the overall sequence to details, follows the survey process.
- Survey data must be fully recorded, tidy and free from erasing and follow the prescribed form.
- Personnel of Consultant are responsible for checking the measurements, calculated daily when the job ends.
- Upon completion of documentation, team leaders and technicians must re-examine, compare the scene, additional shortcomings.
- Supervisor of the Client and Consultant will have to comply with the requirements and contents of the Decree No.15/2013/CP dated 6/2/2013 of the Government, supervisor of the investor to make frequent monitoring survey job from start to finish the job.

2.3 Reference Standard

Proposal of Replacement Standards

No.	Standards to be applied	Standards approved in Decision No1502/QD-BGTVT	Proposed Standards
1	Geodesy works in engineering - general requirements	TCXDVN309-2004	TCVN 9398:2012
2	Specification for measuring and analyzing GPS data	TCXDVN364-2006	TCVN 9401:2012
3	Construction soil site testing method SPT	TCXD226-1999	TCVN 9351:2012
4	Construction soil-physic-mechanical test	TCVN4195-4202-1995	TCVN 4195-4202: 2012
5	Construction soil exploiting packing transporting and maintaining samples	TCXD2683-1991	TCVN 2683:1012

Proposal of Additional Standards

No.	Standards to be applied	Additional Standards
6	Determination of moisture in soils by means of a calcium carbide gas pressure moisture tester	AASHTO T217 (ASTM D2434)
7	Consolidated, undrained triaxial compression test on cohesive soils	AASHTO T29+A197 (ASTM D4767)
8	Standard test method for unconsolidated – undrained triaxial compression test on cohesive soils	ASTM D2850
9	One-dimensional consolidation properties of soils	AASHTO T216 (ASTM D2435 or D4186)
10	Unconfined compressive strength of cohesive soil	AASHTO T208 (ASTM D2166)

No.	Standards to be applied	Additional Standards
11	Standards test method for unconfined compressive strength of intact rock core specimens	ASTM D2938
12	Standard Practice for Rock Core Drilling and Sampling of Rock for Site Investigation	ASTM D 2113-2008
13	Standard Practices for Preserving and Transporting Rock Core Samples	ASTM D 5079-2008
14	Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils	ASTM D 1586-1999
15	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	ASTM D 2216-2010
16	Standard Practice for Correction of Unit Weight and Water Content for Soils Containing Oversize Particles	ASTM D 4718
17	Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate	ASTM C 127-2007
18	Undisturbed sampling	ASTM D1587, D6519

2.4 Equipment and Tools

Machines and equipments using in the survey must ensure to implement technical requirements of the project. List of machine and equipment are in the following table:

No.	Equipment Sub Contractor	Drilling machine & sampling equipment (set)	SPT testing equipments (set)	Total Stations (set)	Water sampling tools (set)
	T&C	16	16	03	16
	Total	16	16	03	16

The quality of all equipment should be inspected carefully before mobilizing and/or commencing the work in order to avoid any unexpected risks.

List of Equipment, Tools and Machinery for each a bore hole

No.	Name	Description	Unit	Quantity
1	Drilling machine	XY100, China	set	1
2	Normal drilling bit	Dia. 130mm	set	1
		Dia. 110mm	set	1
		Dia. 91mm	set	3
		Dia. 76mm	set	2
3	Drilling tube	Dia. 130mm, 1.0m/set	set	1
		Dia. 110mm, 1.5m/set	set	1
		Dia. 91mm, 2.0m/set	set	1
		Dia. 76mm, 2.0m/set	set	1
4	Casing	Dia. 112mm	m	3
5	Drilling arms	Dia. 42mm	m	30
6	Undisturbed sampler	Dia. 91mm, 0.2~0.6m/set	set	20
7	Disturbed sampler	Dia. 91mm, 0.2~0.6m/set	set	15
8	SPT tube	ASTM D 1586	set	1
9	SPT bit	ASTM D 1586	set	1
10	Sampling tray		set	5
11	Bentonite		kg	100
12	Survey Instrument		set	1
13	Camera		set	1

- All captioned equipment is in good condition and calibrated (attached with calibration record)
- Measurement equipment is followed specification on maintenance, transportation and usage.
- Above stated quantity of equipments could be changed in case of being required or necessary.

2.5 Work Procedure

2.5.1 Review Existing Information

- The road alignment shall be provided by (highway design team of) Consultant upon the Client's approval;
- Pier positions shall be provided by (bridge design team of) Consultant upon the Client's approval.

2.5.2 Geological Survey Method

(1) Positioning

This work will be implemented by topographical survey group using high accuracy electronic tachometer NIVO3M and GTS -235N (Topcom – Japan) from planned survey control point. Coordinates of boreholes are taken according to VN2000 coordinate system.

(2) Setup and trial

The machine and equipment drilling stands should be setup properly so that the axis of rotation meets the axis of borehole. After setting up the following item should be checked carefully:

- 1) Error and accuracy of machine
- 2) Lubrication of parts
- 3) Movement status
- 4) Status of wire at winch, pulley
- 5) Damper status
- 6) Technical status of engine
- 7) Status of safety part

After checking and correcting all defects of equipment, run the Testing will be takes place.

(3) Drilling, Sampling and Field Testing

(a) Supplementary drilling

The drilling process, site recording, description of the stony soil and sampling will comply with the current procedures, norms as The process of boring engineering geology investigations TCVN 9437-2012, Highway investigation standard 22TCN-263- 2000 and Highway embankment on soft soil design survey standard 22TCN 262-2000 and other standards.

This work will be conducted by using rotary drilling method and using bentonite liquid for

maintaining of borehole wall.

It only carries out for piers or abutments of bridges, which have no drilling in detail design stage.

Condition of finishing working with boreholes with large and medium bridge boreholes: the drilling must be carried out through the soft soil layer and drilling deeply into the bearing layer from 10m to 12m for clayey soil layers having SPT blow count of greater than 30 or sandy soil having SPT blow count of greater than 50 and into the bearing layer from 6m to 8m for gravel having SPT blow count of greater than 50.

(b) Sampling

During drilling, samples will be taken every 2m for an experiment sample..Disturbed samples and undisturbed samples will be taken by using thin-walled metal tube in conformity with AASHTO T207 for soft soil. After using, all samples should be maintained in such good manner as specified in Specification of Project so that its properties will not be changed.

See Appendix I for sampling and test location.

(c) Standard Penetration Test (SPT)

SPT will be carried out at 2m for one turn interval or at each change of strata whichever is lesser to obtain shear strength and identify the soil's properties following 20 TCVN 9351-2012 or ASTM-D1586. This test is done by the number of blows required to take a standard split spoon sample by 30cm, using a mass of 63.6 kg falling from a height of 76.3 cm terminals penetrate on 45 cm sum total penetrate into the soil. The static ground water level will be recorded carefully for each borehole.

Quantity and location for Test Drilling with SPT are shown in Appendix I.

(4) Finishing and Backfilling the Drilling Hole

The drilling holes should be backfilled after completion to keep or limit changes on properties and status of soil below foundation.

Backfilling Method

- Use clay or sandy clay soil for backfilling.
- In case of backfilling, the diameter of soil should be around 1/2 or 1/3 of the diameter of hole..
- Drop gradually such rolled soil into the holes. Do not drop tumultuously to avoid blocking holes.
- Use the drilling rod to compact the soil in the hole.
- Finally, each hole is marked by wooden stake for inspection later.

(5) Daily report

During implementation Works, drilling results and daily site testing shall be reported to Consultant by site engineers with the following information:

- 1) Structure name
- 2) Bore exact position and code number
- 3) Reduced level of top of bore
- 4) Date and time of boring
- 5) Diameter of bore
- 6) Depth to which bore of each stratum
- 7) Type of plant used
- 8) Depth to base of each stratum

- 9) Description of stratum structure 10) Depth and results of in-situ tests
 11) Static water level 12) Remarks

(6) Storage and transportation of samples to the Laboratory

This work will be started along with drilling and sampling, and under VN standard 2638:2012

Taken samples will be temporarily preserved in the adequate conditions area of the field. The samples are orderly arranged in line and not overlapping, not impacted by driving forces. Those samples should be transported to the laboratory within 05 days.

The stored samples in the laboratory must be ensured on requirements of temperature and timing as well as preservation procedures.

(7) Laboratory for sample testing

Number of samples and parameters must follow the terms of reference. 70% samples taken will be tested in laboratory of which 70% is undisturbed samples and 30% is disturbed samples.

After the geological survey is completed, the Contractor must submit a fully detailed report, including all test results in order to be approved by in charge engineer;

All analyzed samples must comply with current VN standards and follow the list of technical standards below:

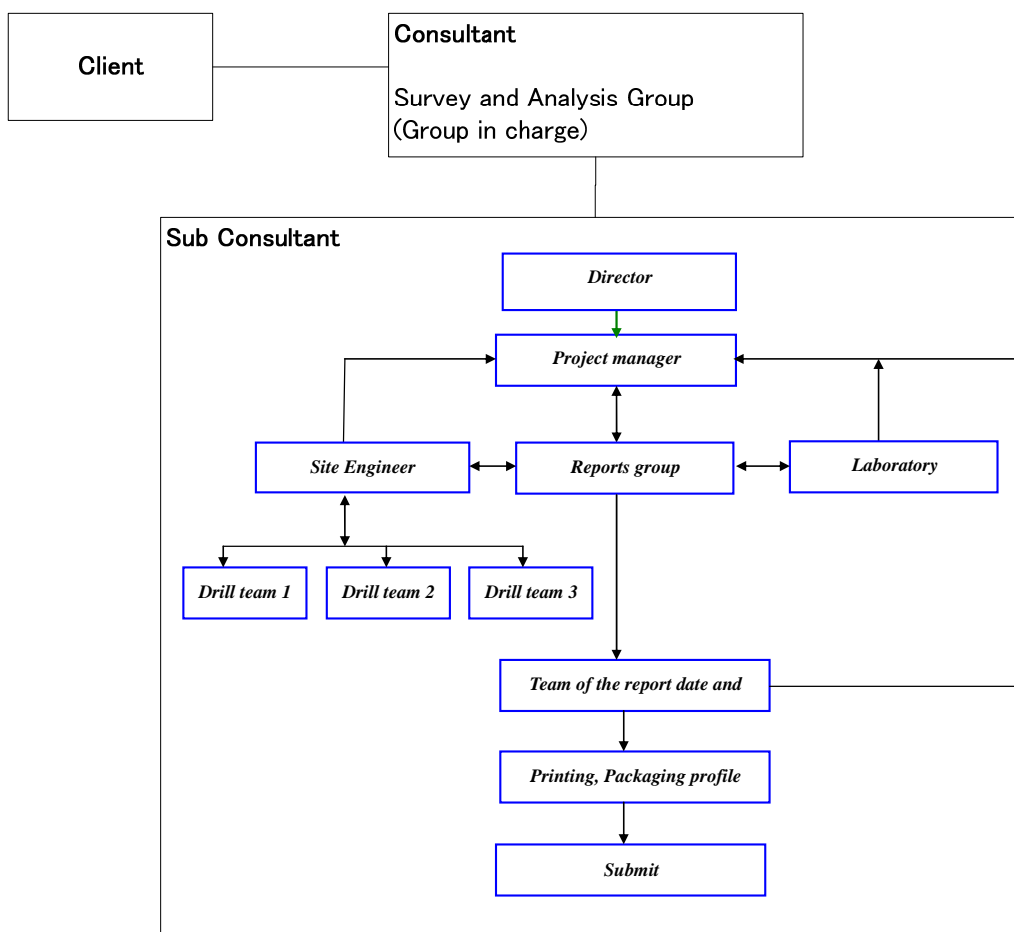
* Undisturbed samples :

No	Test	Symbol	Unit	Standard reference code
1	Grain size distribution	P	%	TCVN 4198:2012
2	Moisture content	W _o	%	TCVN 4196:2012
3	Liquid limit	W _{ch}	%	TCVN 4197:2012
4	Plastic limit	W _d	%	TCVN 4197:2012
5	Plastic Index	I _d	%	Value calculation
6	Liquidity index	I _s		Value calculation
7	Wet density	ρ	g/cm ³	TCVN 4202:2012
8	Dry density	ρ _c	g/cm ³	Value calculation
9	Specific Gravity	Δ	g/cm ³	TCVN 4198:2012
10	Porosity	e		Value calculation
11	Void Ratio	n	%	Value calculation
12	Degree of saturation	G	%	Value calculation
13	Coef of. compress	a _{1.0-2.0}	cm ² /KG	TCVN 4200:2012
14	Cohesion	c	KG/cm ²	TCVN 4199:2012
15	Angle of internal friction	φ	degree	TCVN 4199:2012
16	Unconfined compression test	q _u		ASTM-D2216
17	Total deformation module of soil	E _{1.0-2.0}	KG/cm ²	Value calculation
18	Conventional strength of soil	R ₀	KG/cm ²	Value calculation

* Disturbed samples:

No	Test	Symbol	Unit	Standard reference code
1	Percent passed sieve size	P	%	TCVN 4198:2012
2	Specific Gravity	Δ	g/cm ³	TCVN 4198:2012
3	Moisture content	W ₀	%	TCVN 4196:2012
4	Angle of repose Dry	α_c	degree	TCVN 8724:2012
5	Angle of repose Saturated	α_w	degree	TCVN 8724:2012
6	Void ratio of sand max	e _{max}		TCVN 8721:2012
7	Void ratio of sand min	e _{min}		TCVN 8721:2012
8	Conventional strength of soil	R ₀	KG/cm ²	Value calculation
9	Total deformation module of soil	E ₀	KG/cm ²	Value calculation
10	Average N value / 30cm	N ₃₀	hammer	TCXD 226:1999

2.6 Work Organization



Including:

- 1 Project manager
- 16 Drill team: each with 4 workers and 1 site engineer
- 2 Laboratory: each with 1 Head of the laboratory and 8 laboratory staff
- 3 surveyed reporter

2.7 Key personnel

No.	Position	Name	Tasks	Remark
A	Consultant			
1	Team Leader	Ichizuru Ishimoto	Management and Guidance	Accountability for the Service
2	Deputy Team Leader	Do Hoang Anh	Management and Guidance	
3	Material Engineer	Toru Fujino	In charge	Responsibility for the Team
4	Geological Engineer	Mai Huy Dao	In charge	
B	Sub Consultant			
1	Director	Tran Dung Thang	Engineering geological engineer	
2	Leader of geological survey group	Le Tien Dung	Engineering geological engineer	Acting QC Team Leader
3	Vice leader of geological survey group	Nguyen The Anh	Engineering geological engineer	
4	Leader of Laboratory Las910	Hoang Trung Hieu	Engineering geological engineer	
5	Vice leader of Laboratory Las910	Pham Thi Thu Ha	Engineering geological engineer	
6	Leader of Laboratory Las69	Pham Tuan Anh	Engineering geological engineer	

- Full name of the personnel shall be informed in details upon actual deployment.

- Compliance with Decree No. 12/2009/ND-CP on management of works construction investment and technical requirements of the Project

- Detailed staffing plan is in Appendix IV.

3 Details of Geological Survey

3.1 Other regulations

All items of survey must be taken photo in order to store and attach in Document of geological survey report, as following:

- A photograph of each borehole must be taken with attached information like project name, borehole name, break ground date, a photo of SPT test, a photo of all taken samples and a photo of completing borehole time.
- Laboratory analysis: take a photograph of opening sample and a photograph of stored sample after analysis.

3.2 Laboratory

Laboratory for sample testing is following 02 laboratories.

No	Laboratory	Number LAS	Address
1	Geotechnical and Material Laboratory Department	LAS-XD 910	69/160, Nguyen Khanh Toan, Quan Hoa, Cau Giay, Ha Noi
2	Geotechnical & Inspection Testing Center	LAS-XD 69	237 Luong The Vinh, Trung Van, Tu Liem, Ha Noi

3.3 Traffic safety management

The geological survey is conducted on the median strips, carriageway, and sidewalk of Pham Van Dong Street stretch from Mai Dich Bridge to Thang Long Bridge. Due to the survey is located on a road with crowded dense traffic, especially during rush hours. Thus, in construction solutions, ensuring safe

construction workers and people in traffic is very practical and important.

(1) Preparation prior to survey

- Work area shall be fenced by the thin hard separator, about 70-90cm; due to crowded traffic, so drillers should be arranged neatly and reasonably.
- The occupying area of driller is 3.5m in width, 7.5m in length, before putting the machine to survey position, it's necessary to put signboards, set up a temporary fence around the survey location. In addition to that, it is necessary to appoint staff for traffic guidance to ensure the safety for passing vehicles.

(2) Safety management during survey

- Before construction, machinery is assembled along sidewalks, set up the fence around the machine and signboards;
- After sorting machinery stably, carrying out the preparation of work site:
 - The sites of drill hole surface are arranged 4m x 10m
 - Set up piles in order to protected corridor on both sides of the machine, positioned parallel to the roadway. Piles are designed 1.5m in length, the distance between the poles is 1.5-2m, connected with wire stakes are reflective rope. Each corridor is estimated at 10m.
 - Traffic signal should be settled at the first pile and the last pile and necessary to appoint staff to guide and manage the traffic
 - Set up warning signboards (alert direction warning signboard, narrow road sign board, construction site boards) at two sides of the construction area. Placement of billboards should be about 5m far from marker fence.
 - After finishing the preparation work, it is necessary to appoint staff to guide and manage the traffic to transport the driller to the drilling position. Arranging machine floor neatly, not exceed the scope of construction. During executing the survey, the occupied area by the driller should be about 3-4m; after finished drilling date, put machine's leg (reduced to about 1 meter), supplies and piles neatly in order to return road for traffic participants.
- Because of location of construction includes roadway and sidewalk so construction time should be arranged throughout the day and night:
 - With line heart boreholes, because of high traffic density, conducted time should be at night from 8 pm (previous day) to 4 am (next day)
 - With side walk boreholes, there is a little effect on the circulation of vehicles, so the conducted time should be during the day, starting from 7am to 6 pm.
- On implementing the construction works, all drilling teams must obey all the regulations on labor safety in the construction and regulations during the construction on roads where being exploited. People on the construction site must be fully equipped with protective clothing, shoes, hard hat as prescribed.
- After finished all the construction, original status of road should be returned.

Details of construction solutions can be seen in the drawing (Appendix III)

4 SURVEY SCHEDULE

See Appendix II.

5 WORK QUANTITIES

See Appendix I.

6 DOCUMENTATION AND SUBMISSION

6.1 Report preparation

Geological survey report must be prepared in accordance with TOR and the latest VN standards. Geological survey (10 English, 10 Vietnamese) report shall consist of:

- Explanation of geological survey report;
- Soil physical properties standards;
- Borehole location plan;
- Borehole log (by one form);
- Geotechnical cross-sections (by one form);
- Summary of laboratory soil test result;
- Results of water tests (by one form);
- Detail laboratory testing form (by one form);
- Photos taken at the site;

6.2 Language

All letters submitted to the advisory report uses the English language. Final Report Deliverables will perform in both English and Vietnamese

Appendix I: Estimated quantity and boreholes location plan

BẢNG TỔNG HỢP KHỐI LƯỢNG GIAI ĐOẠN THIẾT KẾ KỸ THUẬT
TABLE OF SUMMARY VOLUME DETAIL DESIGN PHASE

TT No	Lý trình Station	Tên lỗ khoan/ Name of hole	Toạ độ hố khoan/ Coordinate of the borehole		Vị trí + chiều sâu lỗ khoan địa chất / Position and depth of drill hole		Số mẫu / No sample		Số SPT/ No SPT		Xác định mực nước trong hố khoan/ Determination of water level in borehole	Số mẫu thí nghiệm/ Test samples (70%)		Thí nghiệm nén nở hông/ Unconfined compression test	Thí nghiệm nén 3 trục/ Triaxial Compression test		Thí nghiệm nén cố kết/ Consolidation test	Thí nghiệm mẫu nước/ Water samples in boreholes and testing	Ghi chú / Note
			X	Y	Vị trí / Position	Chiều sâu / Depth (m)	Mẫu nguyên dạng/ Undisturbed Sample	Mẫu xáo động/ Disturbed Sample	Điểm cấp đất I-III/ Soil levels I-III point	Điểm cấp đất IV-VI/ Soil levels IV-VI point	Lỗ/ sample	Mẫu nguyên dạng/ Undisturbed Sample	Mẫu xáo động/ Disturbed Sample	mẫu/ sample	CU	UU	mẫu /sample	mẫu /sample	
1	Km 0+248.9	LK1	2327442.276	580957.584	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
2	Km 0+288	LK2	2327481.695	580959.578	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2				1	
3	Km 0+328	LK3	2327522.126	580962.444	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
4	Km 0+368	LK4	2327561.490	580964.072	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
5	Km 0+408	LK5	2327601.176	580965.189	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
6	Km 0+448	LK6	2327641.169	580965.924	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
7	Km 0+488	LK7	2327681.162	580966.664	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
8	Km 0+568	LK8	2327761.117	580969.495	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
9	Km 0+608	LK9	2327801.055	580971.670	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
10	Km0+648	LK10	2327840.958	580974.389	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
11	Km 0+488	LK11	2327880.868	580977.073	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
12	Km 0+728	LK12	2327920.795	580979.496	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
13	Km 0+768	LK13	2327960.702	580982.233	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
14	Km 0+808	LK14	2328000.606	580985.000	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
15	Km 0+848	LK15	2328040.578	580988.248	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
16	Km 0+888	LK16	2328080.443	580990.114	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
17	Km 0+928	LK17	2328120.357	580992.728	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
18	Km 0+967.1	LK18	2328159.367	580995.388	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
19	Km 1+030	LK19	2328222.141	580999.407	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
20	Km 1+108	LK20	2328299.978	581004.412	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
21	Km 1+170.9	LK21	2328362.695	581008.461	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
22	Km1+210	LK22	2328401.766	581010.975	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
23	Km+1+250	LK23	2328441.684	581013.538	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
24	Km1+290	LK24	2328481.602	581016.094	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
25	Km1+330	LK25	2328521.521	581018.644	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
26	Km1+370	LK26	2328561.440	581021.187	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
27	Km1+410	LK27	2328601.359	581023.728	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
28	Km1+450	LK28	2328641.278	581026.268	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
29	Km1+490	LK29	2328681.198	581028.808	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
30	Km1+530	LK30	2328721.117	581031.348	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
31	Km1+570	LK31	2328761.036	581033.888	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1				1	
32	Km1+610	LK32	2328800.956	581036.428	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
33	Km1+650	LK33	2328840.875	581038.968	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
34	Km1+690	LK34	2328880.793	581041.508	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
35	Km1+730	LK35	2328920.713	581044.048	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
36	Km1+770	LK36	2328960.632	581046.592	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
37	Km1+810	LK37	2329000.492	581049.995	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
38	Km1+850	LK38	2329040.433	581052.227	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
39	Km1+890	LK39	2329080.349	581055.009	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
40	Km1+930	LK40	2329120.044	581060.052	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					

BẢNG TỔNG HỢP KHỐI LƯỢNG GIAI ĐOẠN THIẾT KẾ KỸ THUẬT
TABLE OF SUMMARY VOLUME DETAIL DESIGN PHASE

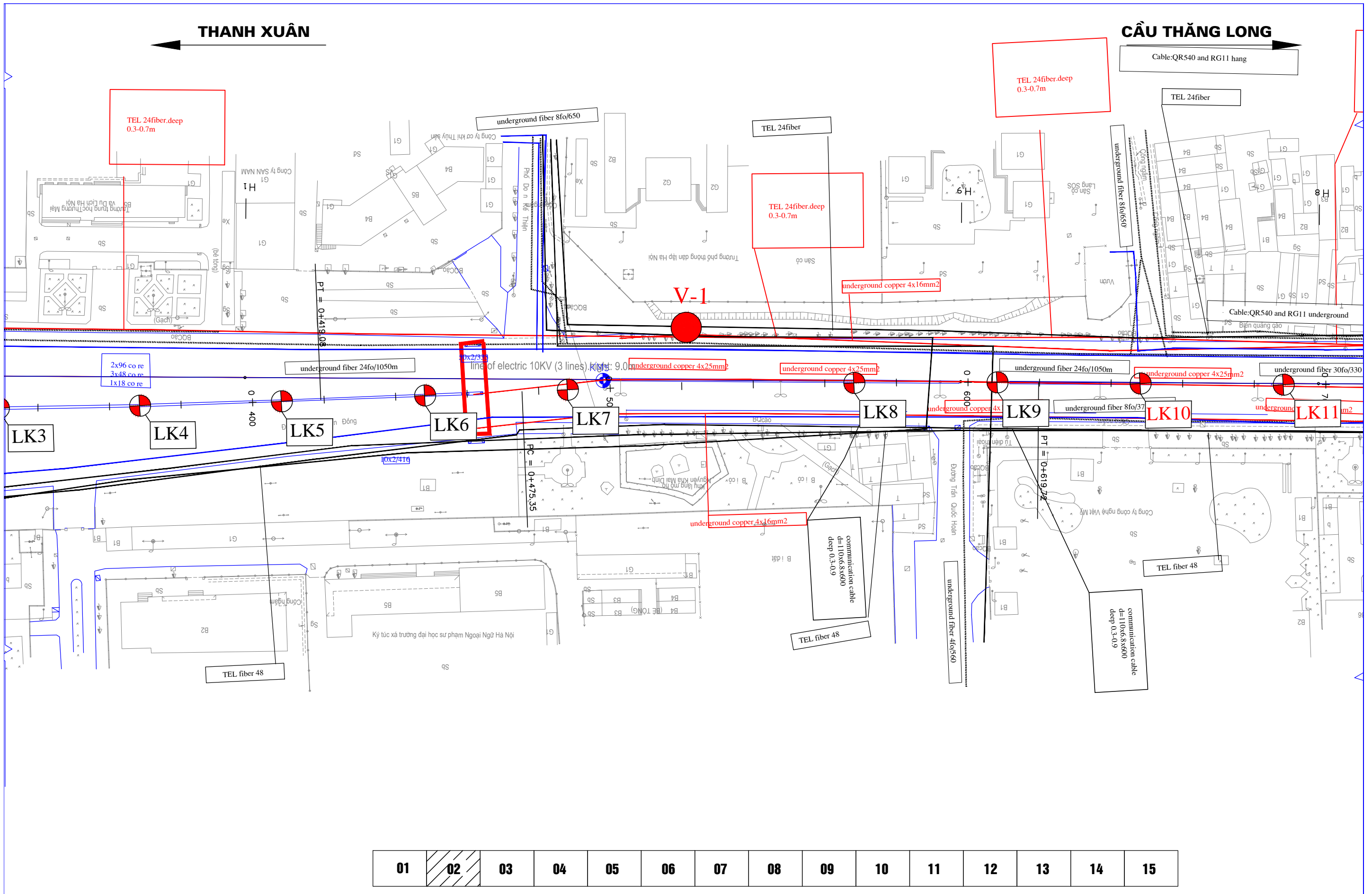
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			X	Y	Vị trí / Position	Chiều sâu / Depth (m)	Mẫu nguyên dạng/ Undisturbed Sample	Mẫu xáo động/ Disturbed Sample	Điểm cấp đất I-III/ Soil levels I-III point	Điểm cấp đất IV-VI/ Soil levels IV-VI point	Lỗ/ sample	Mẫu nguyên dạng/ Undisturbed Sample	Mẫu xáo động/ Disturbed Sample	mẫu/ sample	CU	UU	mẫu /sample	mẫu /sample	
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42	Km2+45.5	LK42	2329233.830	581077.069	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
43	Km2+81.5	LK43	2329269.264	581085.733	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
44	Km2+117.5	LK44	2329304.607	581092.622	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
45	Km2+158	LK45	2329344.080	581101.686	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
46	Km2+193	LK46	2329378.352	581108.839	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
47	Km2+228	LK47	2329412.004	581118.633	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
48	Km2+263	LK48	2329446.331	581125.554	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
49	Km2+298	LK49	2329480.406	581133.547	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
50	Km2+325,125	LK50	2329515.018	581141.439	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
51	Km2+358.375	LK51	2329550.017	581149.875	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
52	Km2+398.625	LK52	2329589.426	581159.210	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
53	Km2+438.875	LK53	2329628.390	581168.258	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
54	Km2+480	LK54	2329667.333	581177.393	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
55	Km2+522	LK55	2329706.276	581186.527	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
56	Km2+564	LK56	2329745.219	581195.662	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
57	Km2+606	LK57	2329784.162	581204.796	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
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59	Km2+690	LK59	2329863.508	581223.408	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
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61	Km2+773	LK61	2329942.855	581242.019	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
62	Km2+812.1	LK62	2329981.052	581250.979	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
63	Km2+875	LK63	2330042.185	581265.318	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
64	Km2+953	LK64	2330118.154	581283.137	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
65	Km3+15.9	LK65	2330179.336	581297.489	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
66	Km3+55	LK66	2330217.404	581306.418	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
67	Km3+95	LK67	2330256.347	581315.552	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
68	Km3+135	LK68	2330295.290	581324.687	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
69	Km3+175	LK69	2330334.232	581333.821	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
70	Km3+215	LK70	2330374.052	581343.161	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
71	Km3+255	LK71	2330412.756	581352.476	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
72	Km3+295	LK72	2330452.105	581360.699	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
73	Km3+335	LK73	2330490.015	581370.312	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
74	Km3+375	LK74	2330529.071	581378.952	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
75	Km3+415	LK75	2330568.336	581386.572	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
76	Km3+495	LK76	2330647.594	581397.297	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	1					
77	Km3+535	LK77	2330687.441	581400.777	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
78	Km3+575	LK78	2330727.392	581403.720	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	1					
79	Km3+615	LK79	2330767.231	581406.577	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
80	Km3+655	LK80	2330807.129	581409.438	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					

BẢNG TỔNG HỢP KHỐI LƯỢNG GIAI ĐOẠN THIẾT KẾ KỸ THUẬT
TABLE OF SUMMARY VOLUME DETAIL DESIGN PHASE

TT No	Lý trình Station	Tên lỗ khoan/ Name of hole	Toạ độ hố khoan/ Coordinate of the borehole		Vị trí + chiều sâu lỗ khoan địa chất / Position and depth of drill hole		Số mẫu / No sample		Số SPT/ No SPT		Xác định mực nước trong hố khoan/ Determination of water level in borehole	Số mẫu thí nghiệm/ Test samples (70%)		Thí nghiệm nén nở hông/ Unconfined compression test	Thí nghiệm nén 3 trục/ Triaxial Compression test		Thí nghiệm nén cố kết/ Consolidation test	Thí nghiệm mẫu nước/ Water samples in boreholes and testing	Ghi chú / Note
			X	Y	Vị trí / Position	Chiều sâu / Depth (m)	Mẫu nguyên dạng/ Undisturbed Sample	Mẫu xáo động/ Disturbed Sample	Điểm cấp đất I-III/ Soil levels I-III point	Điểm cấp đất IV-VI/ Soil levels IV-VI point	Lỗ/ sample	Mẫu nguyên dạng/ Undisturbed Sample	Mẫu xáo động/ Disturbed Sample	mẫu/ sample	CU	UU	mẫu /sample	mẫu /sample	
81	Km3+695	LK81	2330847.026	581412.299	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
82	Km3+735	LK82	2330886.924	581415.161	Vía hè/Side walk	45	16	7	16	7	1	11	5	1					
83	Km3+775	LK83	2330926.862	581418.025	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
84	Km3+815	LK84	2330966.719	581420.883	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
85	Km3+855	LK85	2331006.616	581423.744	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
86	Km3+895	LK86	2331046.514	581426.605	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
87	Km3+935	LK87	2331086.411	581429.466	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
88	Km3+975	LK88	2331126.309	581432.327	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
89	Km4+15	LK89	2331166.207	581435.189	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
90	Km4+55	LK90	2331206.104	581438.050	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
91	Km4+95	LK91	2331246.002	581440.911	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
92	Km4+135	LK92	2331285.151	581443.718	Vía hè/Side walk	45	16	7	16	7	1	11	5	1					
93	Km4+175	LK93	2331325.797	581446.633	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
94	Km4+215	LK94	2331365.694	581449.503	Vía hè/Side walk	45	16	7	16	7	1	11	5	2					
95	Km4+255	LK95	2331405.569	581452.653	Vía hè/Side walk	45	16	7	16	7	1	11	5	1				1	
96	Km4+295	LK96	2331445.360	581456.718	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
97	Km4+335	LK97	2331484.959	581462.344	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
98	Km4+375	LK98	2331524.179	581470.167	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	1					
99	Km4+415	LK99	2331562.922	581480.054	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
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106	Km4+668.2	LK106	2331787.074	581596.781	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
107	Km4+708.2	LK107	2331821.283	581617.512	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
108	Km4+748.2	LK108	2331855.604	581638.054	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
109	Km4+788.2	LK109	2331890.359	581657.854	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	1					
110	Km4+828.2	LK110	2331925.845	581676.305	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
111	Km4+868.2	LK111	2331962.361	581692.603	Tim tuyến / Centre line	45	16	7	16	7	1	11	5	2					
112	Km4+948.2	LK112	2332038.415	581717.052	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
113	Km4+983.2	LK113	2332072.826	581723.400	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	1					
114	Km5+18.2	LK114	2332107.625	581727.055	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
115	Km5+52.3	LK115	2332141.704	581728.005	Lòng đường/ Roadway	45	16	7	16	7	1	11	5	2					
116	Km0+219.6	LK116	2327410.327	580989.189	Phải tuyến +33.8m/ Right side +33.8m	30	12	3	15	0	1	8	2	4	1	1	1		
117	Km5+78.70	LK117	2332168.539	581742.253	Phải tuyến +15.9m/ Right side +15.9m	30	12	3	15	0	1	8	3	4	1	1	1		
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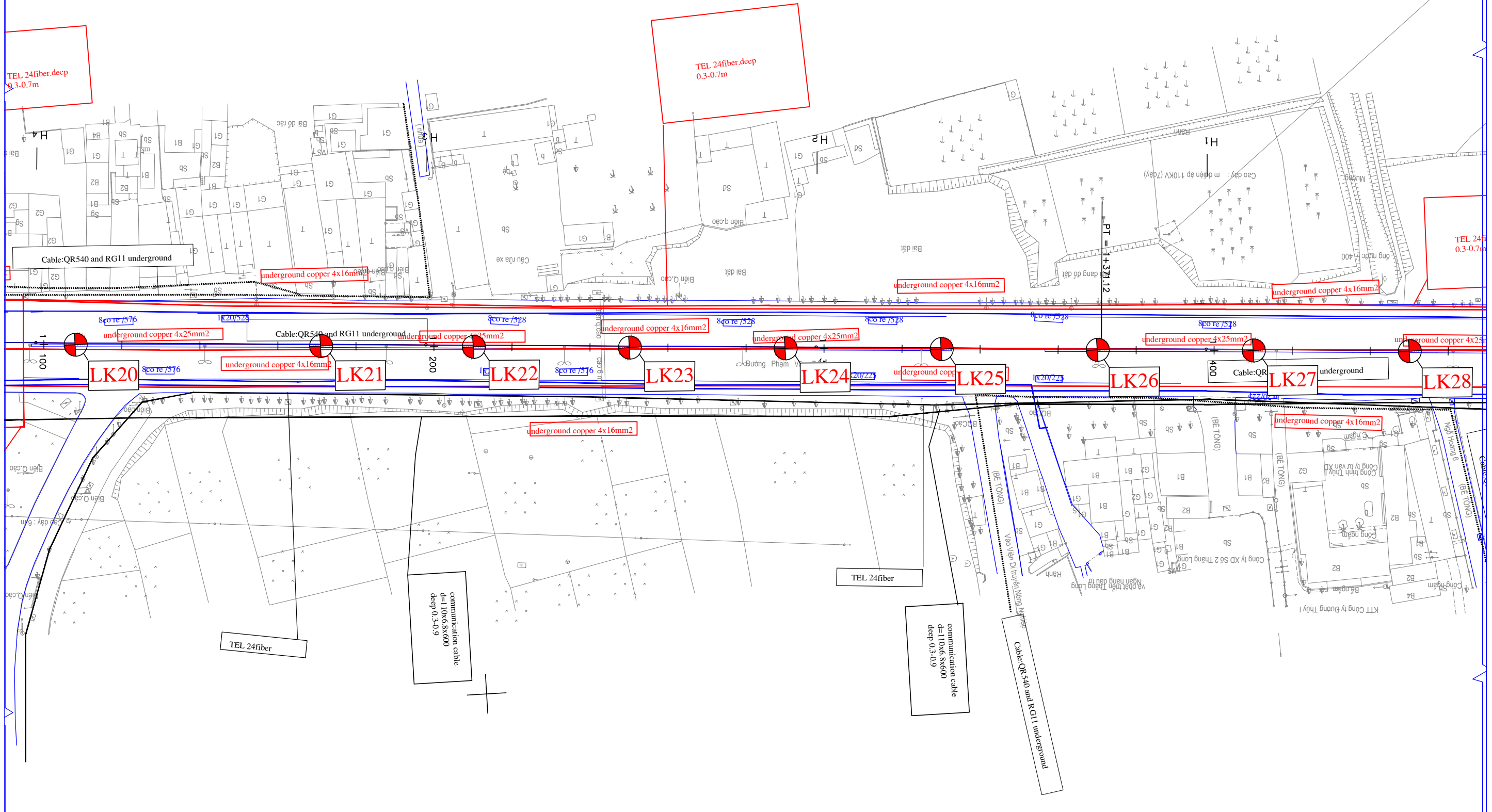
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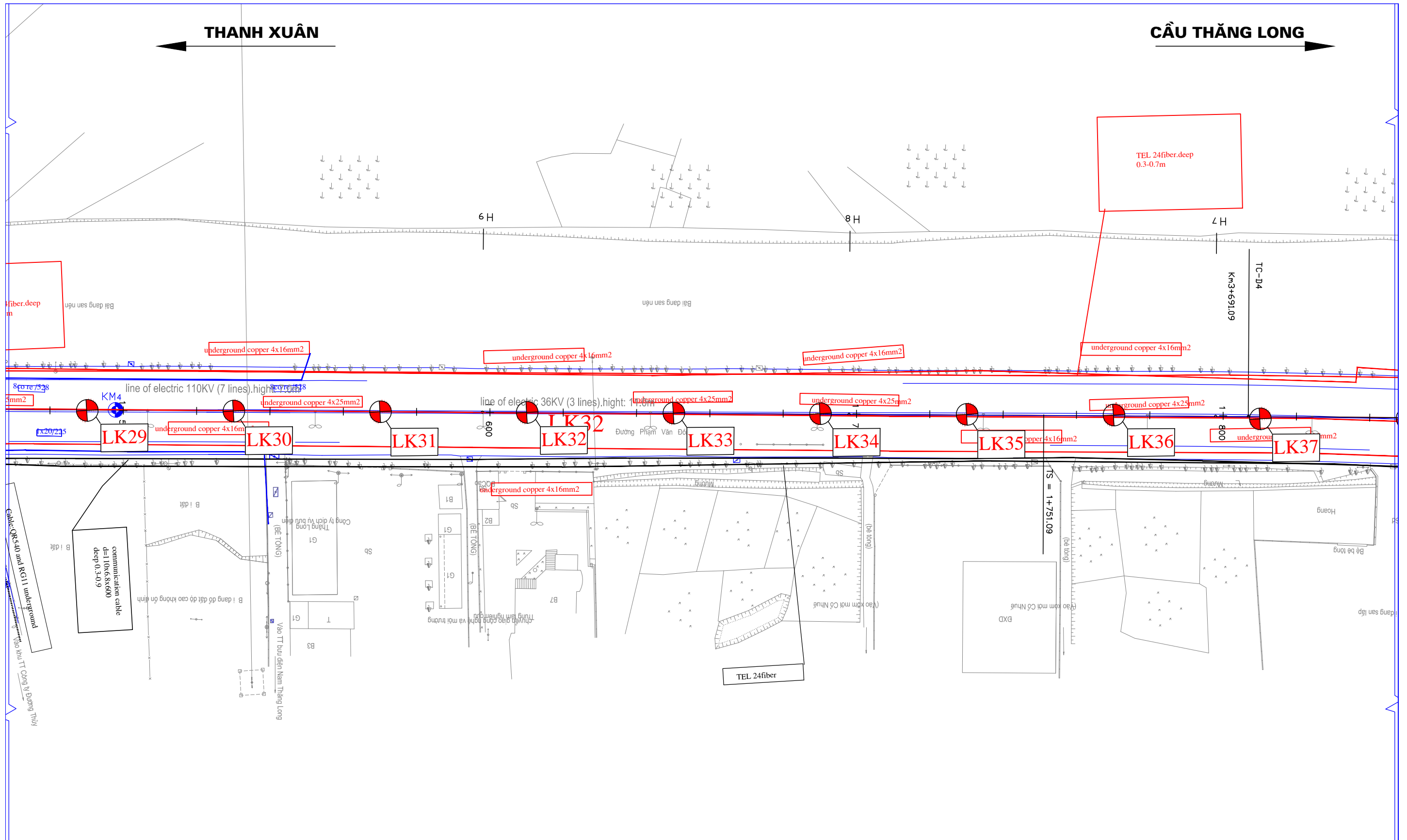
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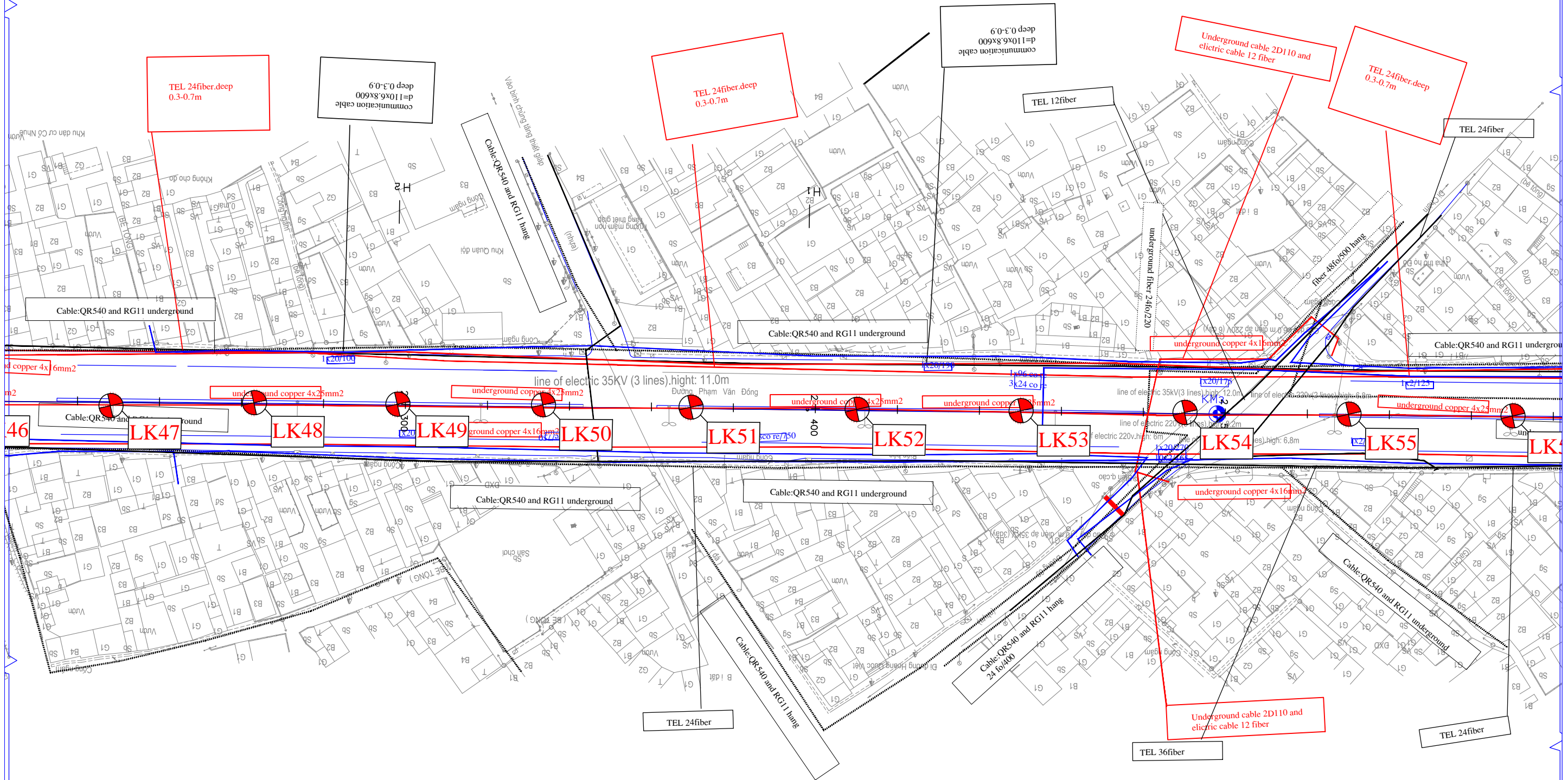
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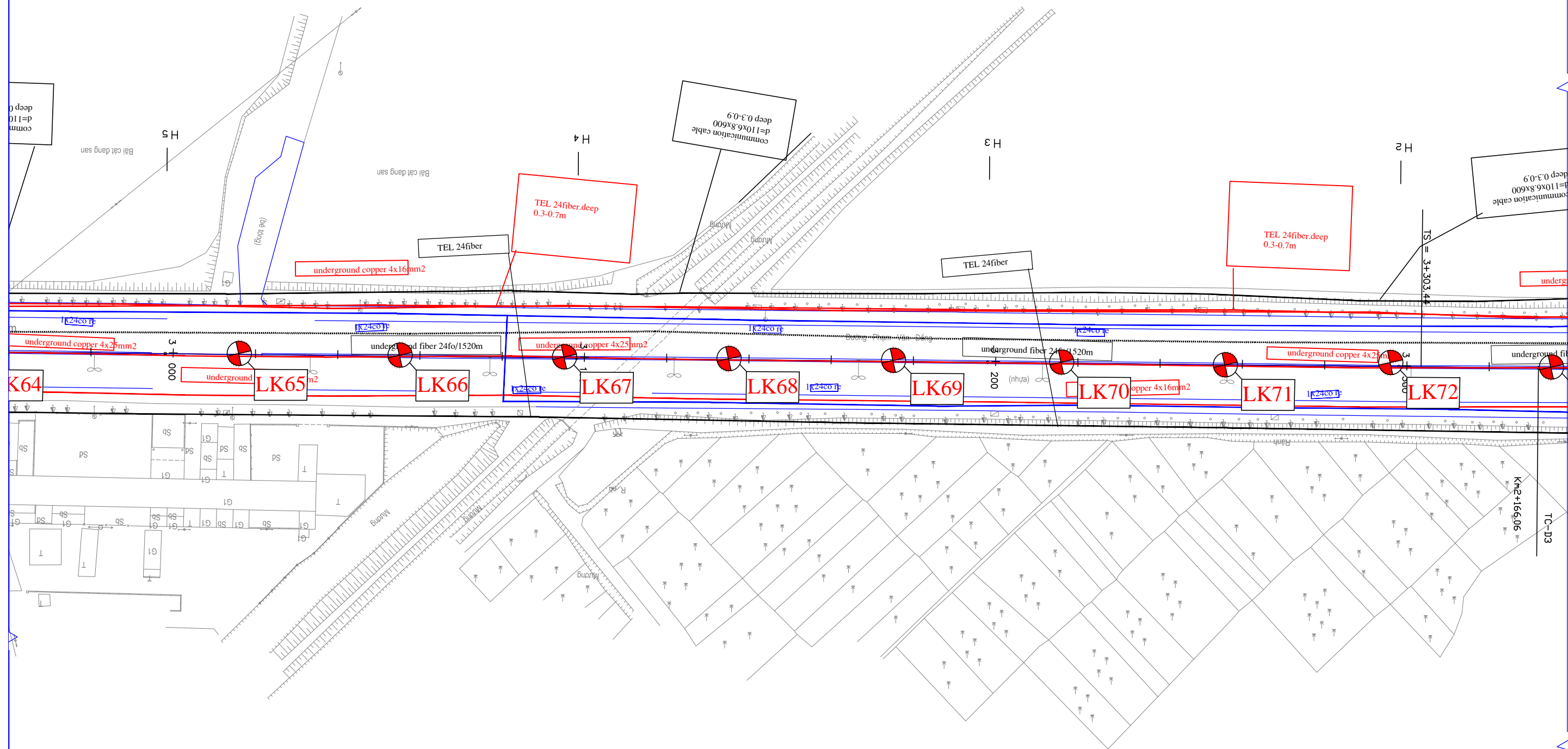
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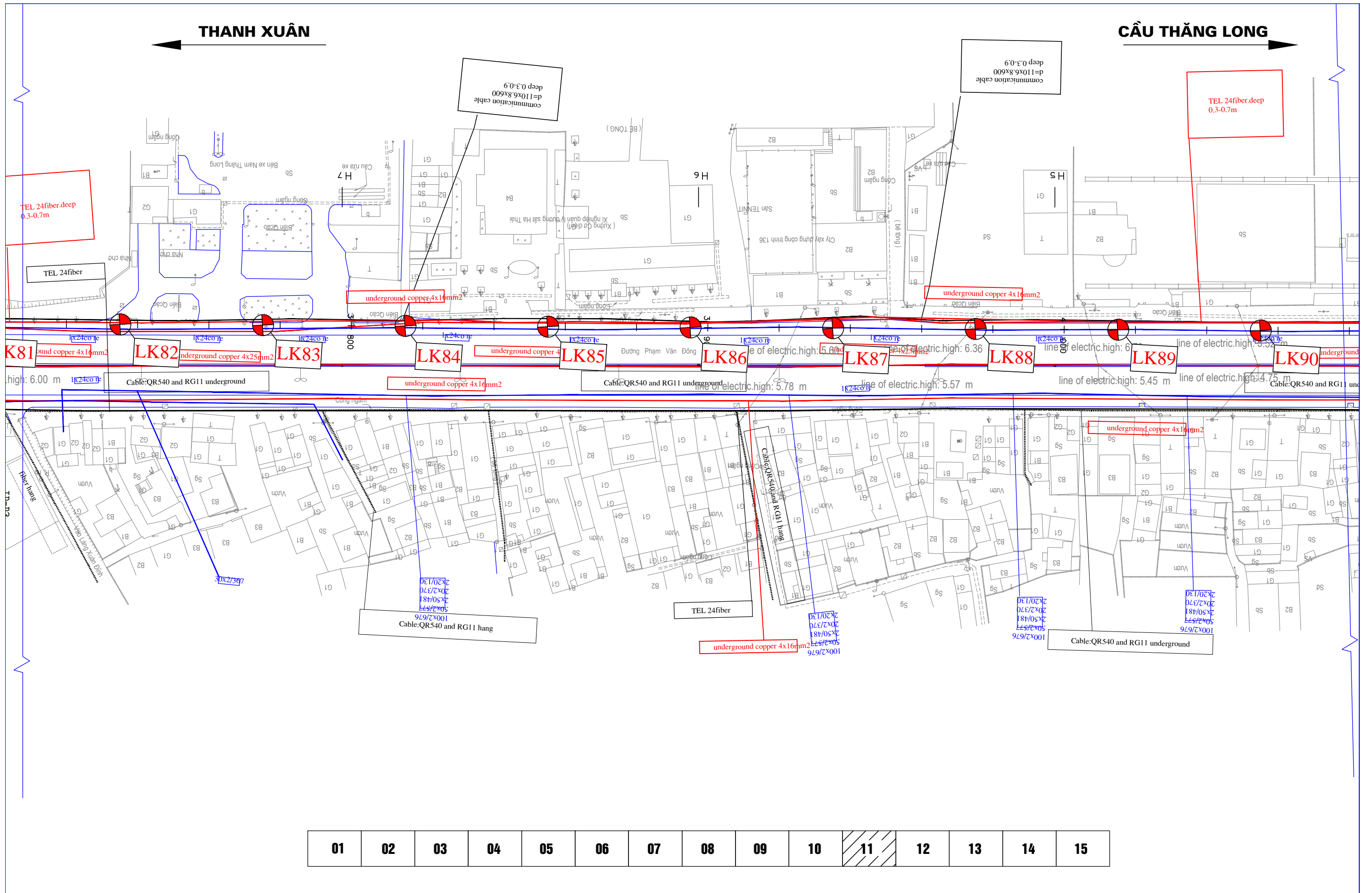
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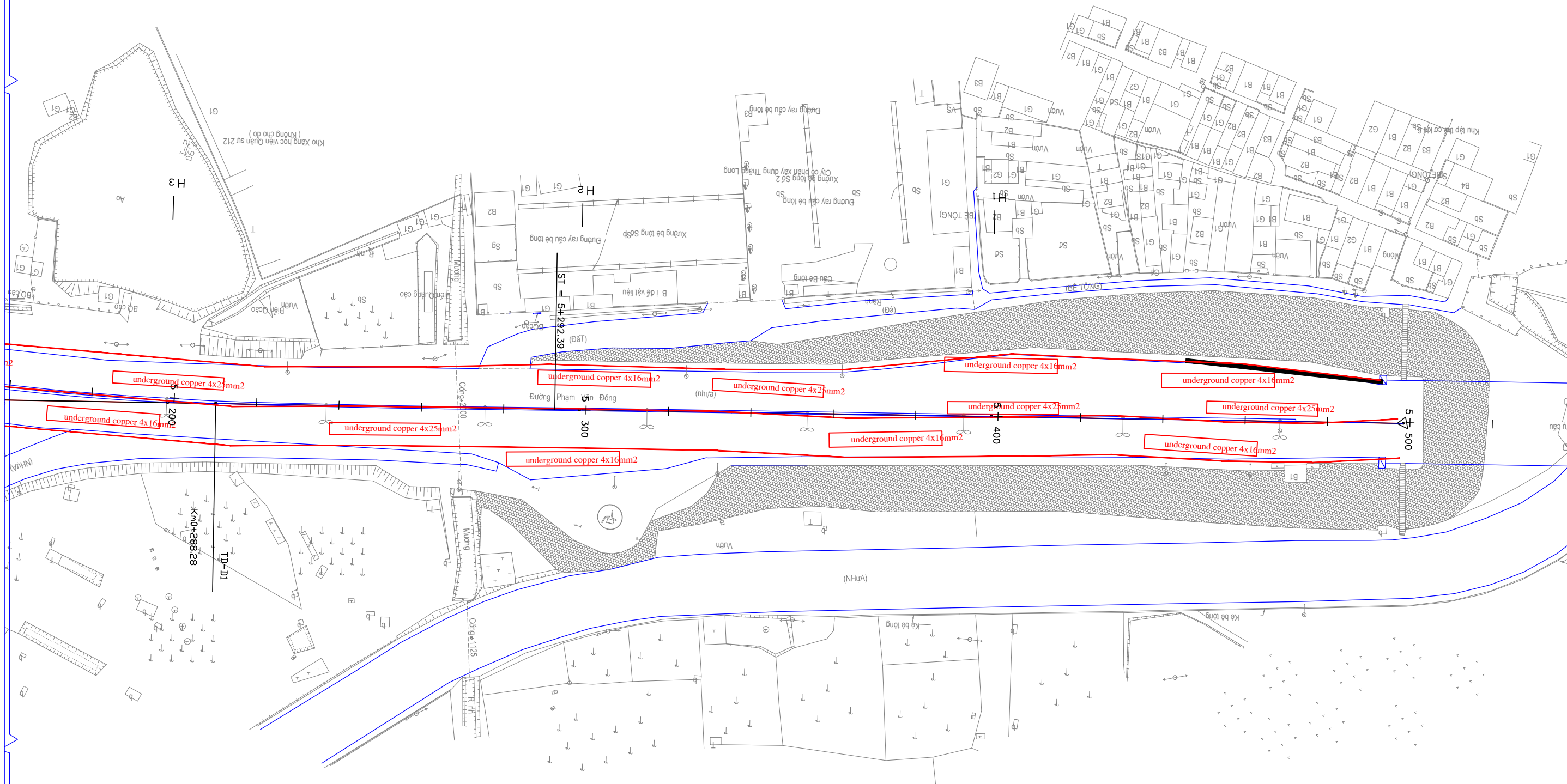
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THANH XUÂN

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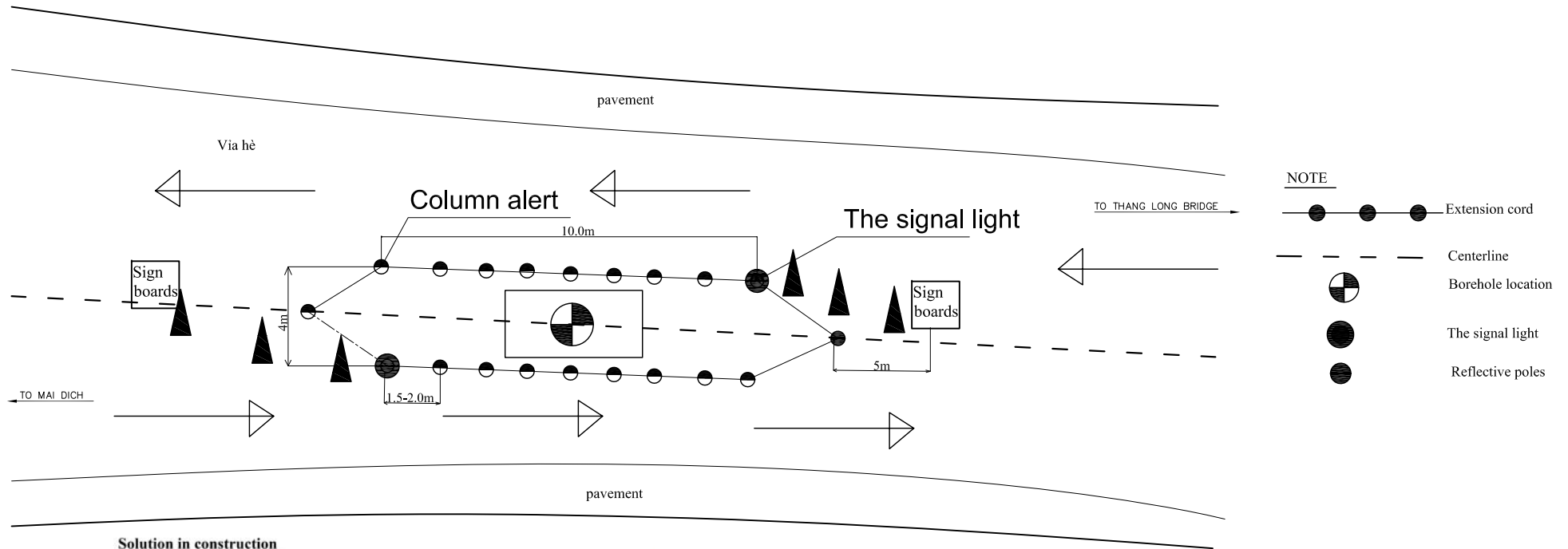


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Appendix II: Investigation Schedule

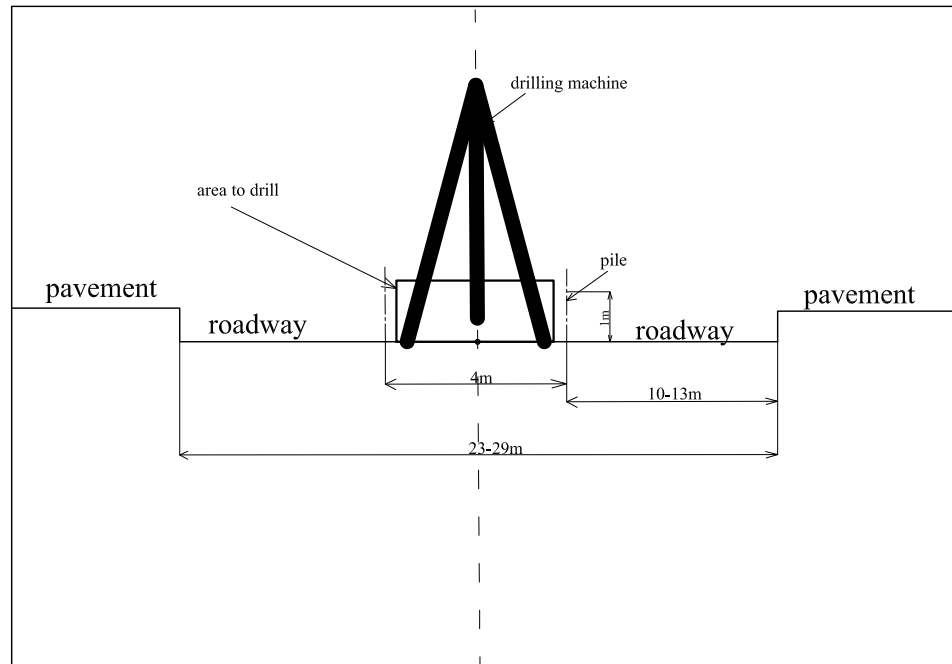
AppendixIII: Safety Plan

Drill holes located on the centerline




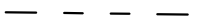



Solution in construction

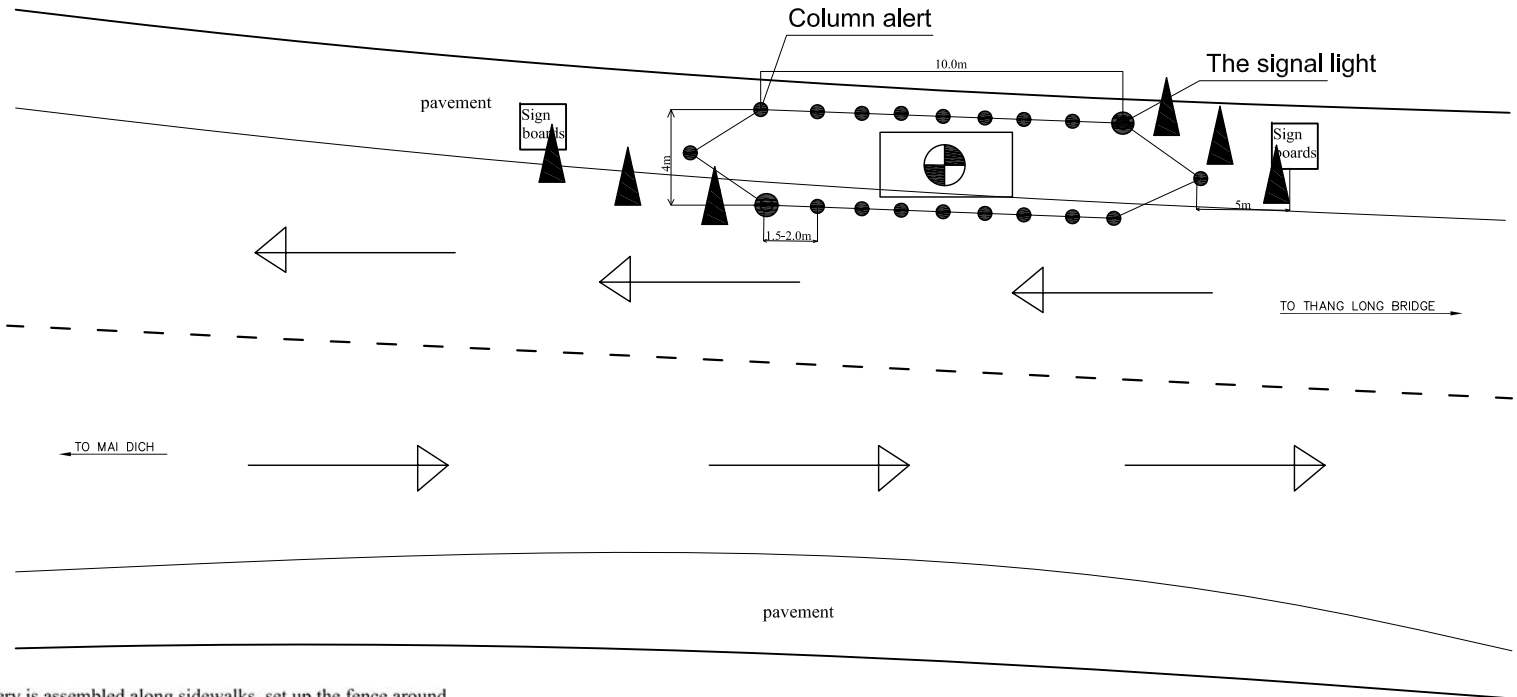
- Before construction, machinery is assembled along sidewalks, set up the fence around the machine and signboards;
- After sorting machinery stably, we can carry out preparation of work site:
 - + The surface of drill holes are arranged 4m x 10m
 - + Set up piles into protected corridor on two sides of the machine, positioned parallel to the roadway. Piles are designed 1.5m in length, the distance between the poles is 1.5-2m, connected with wire stakes are reflective rope. Each corridor is estimated at 10m.
 - + Traffic signal lights should be settled at the first pile and the end pile.
 - + Put up warning signs (alert direction warning signs, narrow roads, construction sites) at two sides of the construction area. Placement of billboards should be far 5m from marker fence.
 - + The work of transporting machinery work must nominate a holding flag and traffic management
- Arranging machine floor neatly, not exceed the scope of construction. When doing construction, the occupied area by the driller should be about 3-4m; after the last drilling date, put machine's line in order (reduced to about 1 meter), supplies and piles to return road for traffic participants
- Due to the location of construction including roadway and sidewalk so construction time should be arranged throughout the day and night:
 - + Boreholes at line heart, because of high traffic density, conducted time should be at night from 20h (previous day) to 4 am (next day)
 - + Drill holes located on the sidewalk, there is a little effect on the circulation of vehicles, so the conducted time should be during the day, starting from 7am to 18h
- When participating in the construction, all drilling teams must abide by the regulations on labor safety in the construction and regulations during the construction on roads are exploited. Participants construction must be fully equipped with protective clothing, shoes, hard hat as prescribed
- After construction, original status of road should be returned.



Drill holes located on the sidewalk

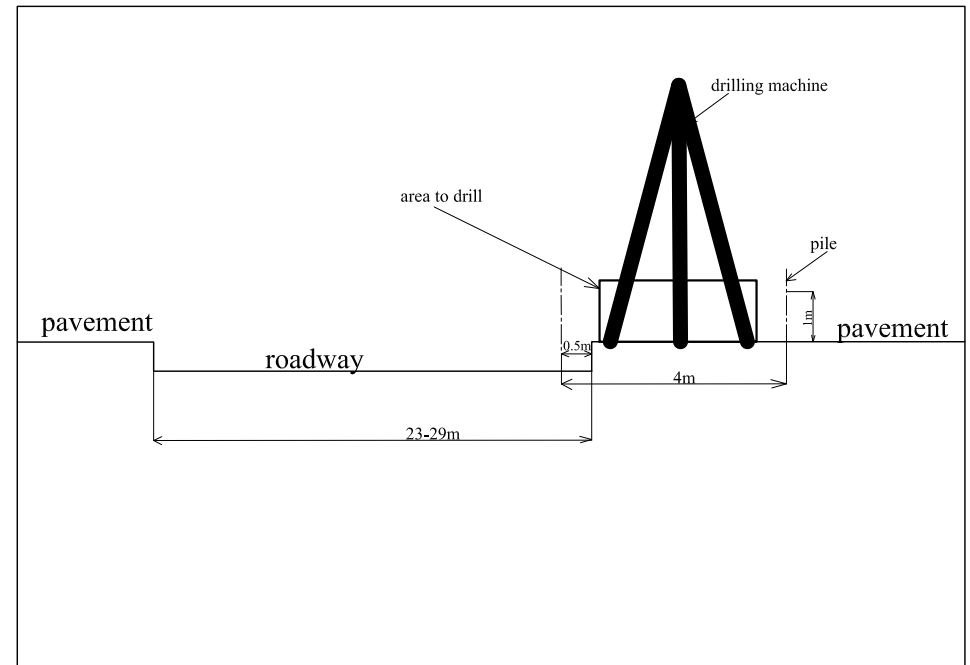
NOTE

-  Extension cord
-  Centerline
-  Borehole location
-  The signal light
-  Reflective poles



Solution in construction

- Before construction, machinery is assembled along sidewalks, set up the fence around the machine and signboards;
- After sorting machinery stably, we can carry out preparation of work site:
 - + The surface of drill holes are arranged 4m x 10m
 - + Set up piles into protected corridor on two sides of the machine, positioned parallel to the roadway. Piles are designed 1.5m in length, the distance between the poles is 1.5-2m, connected with wire stakes are reflective rope. Each corridor is estimated at 10m.
 - + Traffic signal lights should be settled at the first pile and the end pile.
 - + Put up warning signs (alert direction warning signs, narrow roads, construction sites) at two sides of the construction area. Placement of billboards should be far 5m from marker fence.
 - + The work of transporting machinery work must nominate a holding flag and traffic management
- Arranging machine floor neatly, not exceed the scope of construction. When doing construction, the occupied area by the driller should be about 3-4m; after the last drilling date, put machine's line in order (reduced to about 1 meter), supplies and piles to return road for traffic participants
- Due to the location of construction including roadway and sidewalk so construction time should be arranged throughout the day and night:
 - + Boreholes at line heart, because of high traffic density, conducted time should be at night from 20h (previous day) to 4 am (next day)
 - + Drill holes located on the sidewalk, there is a little effect on the circulation of vehicles, so the conducted time should be during the day, starting from 7am to 18h
- When participating in the construction, all drilling teams must abide by the regulations on labor safety in the construction and regulations during the construction on roads are exploited. Participants construction must be fully equipped with protective clothing, shoes, hard hat as prescribed
- After construction, original status of road should be returned.



Appendix IV: Staffing Plan

HUMAN RESOURCE

No	Full name	Unit (KS)	Main subject	Job title	Mission
1	Tran Dung Thang	Service Trading Technology and Construction JSC	Engineering geological engineer	Director	Take general undertaking
2	Le Tien Dung	Service Trading Technology and Construction JSC	Engineering geological engineer	Leader of geological survey group	Monitor work, assign technician, equipment, manpower; formulate progress, administer progress, transact with consultor or investor, check survey results, and take responsibility for survey results
3	Nguyen The Anh	Service Trading Technology and Construction JSC	Engineering geological engineer	Vice leader of geological survey group	As above
4	Nguyen Van Tinh	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	Take undertaking of site matters in accordance with assignment of chairman and vice chairman; verify technology of soil and stone in site; associate with chairman and vice chairman to deal with problems arisen.
5	Nguyen Phong Hai	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
6	To Hai Hau	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
7	Doan Xuan Truong	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
8	Nguyen Khac Khang	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
9	Do Huu Hai	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above

10	Nguyen Duc Nghiep	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
11	Pham Dac Khiem	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
12	Hoang Van Khuong	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
13	Nguyen Minh Phong	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
14	Vo Ho Quang	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
15	Pham Huy Huan	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
16	Hoang Minh Toan	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
17	Nguyen Quang Doanh	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
18	Nguyen Thanh Doanh	Service Trading Technology and Construction JSC	Engineering geological engineer	Site Engineer	As above
19	Hoang Trung Hieu	Service Trading Technology and Construction JSC	Engineering geological engineer	Leader of Laboratory	Take undertaking of indoor experiment matters such as: formulate plan, progress; supervise plan, progress of experiment activity, and administer experiment activity
20	Pham Thi Thu Ha	Service Trading Technology and Construction JSC	Engineering geological engineer	Vice leader of Laboratory	Be on behalf of head of laboratory; administer experiment activity
21	Nguyen Van Hai	Service Trading Technology and Construction JSC	Laboratory staff	Laboratory staff	Implement experiment operations; bear assignment of head of laboratory and deputy head of laboratory

22	Tran Thi Phuong Dung	Service Trading Technology and Construction JSC	Engineering geological engineer	Laboratory staff	As above
23	Phan Dinh Dai	Service Trading Technology and Construction JSC	Laboratory staff	Laboratory staff	As above
24	Nguyen Thi Thu	Service Trading Technology and Construction JSC	Laboratory staff	Laboratory staff	As above
25	Tran Thi Huyen	Service Trading Technology and Construction JSC	Engineering geological engineer	Laboratory staff	As above
26	Nguyen Thi Hong Hue	Service Trading Technology and Construction JSC	Laboratory staff	Laboratory staff	As above
27	Nguyen Huu Tuan	Service Trading Technology and Construction JSC	Engineering geological engineer	Laboratory staff	As above
28	Bui Van Loi	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and sampling operations in site
29	Bui Ngoc Thinh	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
30	Bui Quang Thinh	Service Trading Technology and Construction JSC	Worker	Worker	As above
31	Bui The Anh	Service Trading Technology and Construction JSC	Worker	Worker	As above
32	Bui Van Quy	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and sampling operations in site

33	Cao Ba Ngoc	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
34	Chu Van Dong	Service Trading Technology and Construction JSC	Worker	Worker	As above
35	Đang Van Boi	Service Trading Technology and Construction JSC	Worker	Worker	As above
36	Dang Ngoc Tuyen	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and sampling operations in site
37	Dinh Lam Son	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
38	Dang Van Thi	Service Trading Technology and Construction JSC	Worker	Worker	As above
39	Dang Van Thuc	Service Trading Technology and Construction JSC	Worker	Worker	As above
40	Dao Van Duy	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and sampling operations in site
41	Dau Cong Hiep	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site

42	Dau Xuan Dong	Service Trading Technology and Construction JSC	Worker	Worker	As above
43	Dinh Van Thao	Service Trading Technology and Construction JSC	Worker	Worker	As above
44	Dinh Van Xuan	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and sampling operations in site
45	Do Hong Thuan	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
46	Duong Van Hue	Service Trading Technology and Construction JSC	Worker	Worker	As above
47	Hoang Anh Tuan	Service Trading Technology and Construction JSC	Worker	Worker	As above
48	Nguyen Anh Tuan	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and sampling operations in site
49	Nguyen Van Vy	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
50	Nguyen Xuan Hoa	Service Trading Technology and Construction JSC	Worker	Worker	As above
51	Nguyen Xuan Nam	Service Trading Technology and Construction JSC	Worker	Worker	As above
52	Nguyen Xuan Son	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and

					sampling operations in site
53	Pham Van Hoang	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
54	Pham Van Hung	Service Trading Technology and Construction JSC	Worker	Worker	As above
55	Pham Van Quoc	Service Trading Technology and Construction JSC	Worker	Worker	As above
56	Phan Tien Vinh	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator; implement drilling and sampling operations in site
57	Thai Ngo Hue	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
58	Tong Viet Hoang	Service Trading Technology and Construction JSC	Worker	Worker	As above
59	Tran Dinh Trong	Service Trading Technology and Construction JSC	Worker	Worker	As above
60	TranThanh Minh	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator; implement drilling and sampling operations in site
61	Tran Van Tao	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site

62	Vu Van Minh	Service Trading Technology and Construction JSC	Worker	Worker	As above
63	Vu Duy Huong	Service Trading Technology and Construction JSC	Worker	Worker	As above
64	Vu Duc Manh	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and sampling operations in site
65	Vu Van Ngoc	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
66	Vy Duc Hoang	Service Trading Technology and Construction JSC	Worker	Worker	As above
67	Vu Ba Quan	Service Trading Technology and Construction JSC	Worker	Worker	As above
68	Tran Xuan Luong	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and sampling operations in site
69	Tran Dinh Trinh	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
70	Vu Van Ngoc	Service Trading Technology and Construction JSC	Worker	Worker	As above
71	Hoang Thu Hoang	Service Trading Technology and Construction JSC	Worker	Worker	As above
72	Le Bai Hai	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and

					sampling operations in site
73	Lai Quang Thanh	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
74	Kieu Van Ve	Service Trading Technology and Construction JSC	Worker	Worker	As above
75	Hoang Duc Viet	Service Trading Technology and Construction JSC	Worker	Worker	As above
76	Le Quang Huy	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator; implement drilling and sampling operations in site
77	Le Quang Hung	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
78	Le Hoai Son	Service Trading Technology and Construction JSC	Worker	Worker	As above
79	Le Duc Toan	Service Trading Technology and Construction JSC	Worker	Worker	As above
80	Le Thanh Duong	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator; implement drilling and sampling operations in site
81	Le Truong Xa	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site

82	Nguyen Anh Tuan	Service Trading Technology and Construction JSC	Worker	Worker	As above
83	Ngo Xuan Huong	Service Trading Technology and Construction JSC	Worker	Worker	As above
84	Ngo Duc Thanh	Service Trading Technology and Construction JSC	Worker	Team leader	Bear administration of Technician in site; administer members in group of drilling equipment operator;implement drilling and sampling operations in site
85	Nghiem Phu Thinh	Service Trading Technology and Construction JSC	Worker	Worker	Bear administration of Technician and Team leader in site; operate drilling equipment; implement drilling and sampling operations in site
86	Luong Cong Hieu	Service Trading Technology and Construction JSC	Worker	Worker	As above
87	Luong Cong Hau	Service Trading Technology and Construction JSC	Worker	Worker	As above

Ha Noi, date

CONTRACTOR

Appendix V: Minutes

Refer to next page as attached

- (1) Request of Inspection
- (2) Checking record or equipment and labour at site
- (3) Minutes of determination for co-ordinate and elevation
- (4) Daily records construction and quality of works
- (5) Minutes of completion for drilled borehole
- (6) Minutes of taking water sample
- (7) Minutes of backfilling for drilled borehole
- (8) Minutes of sample transportation to LAB
- (9) Minutes of changing for borehole position

Hanoi City Ring Road No.3 Construction Project, Mai Dich – South Thang Long Section

Dự án xây dựng đường vành đai 3 – Hà Nội, đoạn Mai Dịch - Nam Thăng Long

The Contractor / Nhà thầu thi công Trading Technology Construction. JSC(T&C)	On behalf of the Employer / Đại diện Chủ đầu tư PMU Thang Long	The Engineer / Tư vấn Giám sát NK-KE-NKV JV
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Package (Gói thầu): Station (Lý trình): Km	Work Item (Hạng mục công việc): Soil Investigation / Khảo sát địa chất	Form No. GEO-00
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CHECK LIST FOR ACCEPTANCE OF SOIL INVESTIGATION DANH MỤC NGHIỆM THU CÔNG TÁC KHẢO SÁT ĐỊA CHẤT CÔNG TRÌNH

BOREHOLE No. (HỐ KHOAN SỐ):

Working time (Thời gian thực hiện): from (từ) to (đến)

The following documents have been submitted to the Inspection Team of PMU and checked carefully by himself and the Engineers of the Consultant:

(Các tài liệu này đã được đệ trình lên Tổ Giám sát hiện trường của PMU và đã được kiểm tra cẩn thận cùng Kỹ sư Tư vấn):

CHECK LIST (Danh sách kiểm tra)	Confirmation (Xác nhận)	
	Yes (Có)	No (Không)
1/ Request of Inspection RFI No. dated on/...../2015. (Phiếu yêu cầu giám sát số RFI ngày/...../2015)		
2/ Checking record or equipment and labour at site (Biên bản kiểm tra máy móc thiết bị và nhân lực tại hiện trường)		
3/ Minutes of determination for co-ordinate and elevation (Biên bản xác định tọa độ và cao độ lỗ khoan)		
4/ Minutes of completion for drilled borehole (Biên bản nghiệm thu kết thúc lỗ khoan)		
5/ Minutes of taking water sample (Biên bản lấy mẫu nước ngầm).		
6/ Minutes of backfilling for drilled borehole (Biên bản lấp lỗ khoan).		
7/ Minutes of sample transportation to LAB (Biên bản chuyển mẫu về phòng thí nghiệm).		
8/ Minutes of changing for borehole position (Biên bản thay đổi vị trí lỗ khoan).		
9/ Appendix (Các phụ lục):		
9.1. Daily field record of geological drilling (Nhật ký khoan ĐCCT)		
9.2. Photographs (Ảnh chụp)		

SITE ENGINEER (DRILLING TEAM)
KỸ SƯ HIỆN TRƯỞNG (TỔ KHOAN)

SUPERVISOR OF CONSULTANT
GIÁM SÁT CỦA TƯ VẤN

INSPECTOR OF PMU
GIÁM SÁT CỦA PMU

Guidance on the Record of Form BBMMNL
(Hướng dẫn ghi chép mẫu BBMMNL)

CHECKING RECORD OF EQUIPMENT AND LABOUR AT SITE
(Biên bản kiểm tra máy móc thiết bị và nhân lực tại hiện trường)

Before start of construction, the actually mobilized equipment and labor shall be checked and recorded using this form (BBMMNL). The checking results shall be submitted immediately to the Engineer (Site Office, Core Team) and Employer.	Trước khi thi công, các thiết bị và nhân lực huy động thực tế đến công trường phải được kiểm tra và lập biên bản theo mẫu BBMMNL. Kết quả kiểm tra phải được trình nộp ngay cho Kỹ sư Tư vấn (VP Hiện trường, VP Trung tâm), và cho Chủ đầu tư
Equipment (Máy móc)	
1. Method Statements: Please record the list of equipments as approved with the Method Statements, including equipment type, capacity, and quantity	1. Biện pháp thi công: Đề nghị ghi danh mục thiết bị theo Biện pháp Thi công được duyệt, ghi rõ chủng loại, công suất, và số lượng
2. Actually Mobilized at Site: Please record the type, capacity and quantity of actually mobilized equipment at site.	2. Thực tế huy động tại công trường: Đề nghị ghi chủng loại, công suất và số lượng máy móc thực tế huy động đến công trường.
3. Condition: Please record the general condition of the equipment (visual check), as “Normal” or “Bad”	3. Tình trạng: Đề nghị ghi tình trạng chung của máy (kiểm tra bằng mắt) và ghi “BT” hoặc “Không tốt”.
4. Trial operation: All the equipment should be checked by trial operation to confirm the normal functioning of the equipment. This may mean trial operation (without loading) or commissioning (with loading), relevant to the function of equipment.	4. Chạy thử: Tất cả thiết bị cần được kiểm tra chạy thử để khẳng định khả năng hoạt động bình thường. Chạy thử có thể là chạy có tải hoặc không tải, phù hợp với chức năng hoạt động của thiết bị.
5. Certificate: For key equipment, the inspection certificate should be presented to the Engineer’s staff. For all testing equipment, a calibration certificate shall be submitted to the Engineer’s staff. If the equipment is highly dangerous, a safety certificate shall be presented.	5. Chứng chỉ: Đối với thiết bị chủ chốt, cần trình chứng chỉ đăng kiểm cho TVGS. Đối với tất cả các thiết bị thí nghiệm phải trình chứng chỉ kiểm định cho TVGS. Nếu thiết bị có yêu cầu an toàn cao, phải trình chứng chỉ (giấy phép) an toàn.
Labour (Nhân lực)	
1. Method Statements: Please record the list of personnel and labour as approved with the Method Statements, including position / labour trade, and quantity	1. Biện pháp thi công: Đề nghị ghi danh mục cán bộ và công nhân theo BPTC được duyệt, ghi rõ chức danh / nghề (loại công việc), và số lượng.
2. Number and Full Name: Each person shall be recorded by one row, corresponding to the position / labour trade listed in the Method Statements.	2. Số thứ tự, Họ và tên: Mỗi người phải ghi vào 1 dòng, tương ứng với chức vụ / nghề ghi trong Biện pháp Thi công.
3. Employer: Please record the employer of each person. A labour contract shall be presented to the Engineer’s staff.	3. Người sử dụng lao động: Đề nghị ghi người sử dụng lao động của mỗi cá nhân. Phải trình hợp đồng lao động cho TVGS.
4. Training: Please record the education / training of the person, relevant to the assigned position / trade.	4. Đào tạo: Đề nghị ghi rõ học vấn / đào tạo của từng cá nhân, phù hợp với chức vụ và công việc được giao.
5. Experience: Please interview and record the year of experience of each person, relevant to the assigned position / trade.	5. Kinh nghiệm: Đề nghị phỏng vấn từng cá nhân và ghi rõ số năm kinh nghiệm, phù hợp với chức vụ và công việc được giao.
6. Skill grade: Please present to the Engineer’s staff a certificate of skill grade (if any) and record the grade written in the certificate.	6. Bậc thợ: Đề nghị trình TVGS chứng chỉ bậc thợ (nếu có) và ghi bậc thợ trên chứng chỉ vào ô tương ứng.
If the required certificates / contracts are not presented to the Engineer’s staff, please cross the relevant cell (Nếu Nhà thầu không trình các chứng chỉ / hợp đồng theo yêu cầu cho nhân viên của Kỹ sư, thì gạch chéo ô tương ứng)	

Hanoi City Ring Road No.3 Construction Project, Mai Dich – South Thang Long Section

Dự án xây dựng đường vành đai 3 – Hà Nội, đoạn Mai Dịch - Nam Thăng Long

The Contractor / Nhà thầu thi công
**Trading Technology
Construction. JSC(T&C)**

On behalf of the Employer
Đại diện Chủ đầu tư
PMU Thang Long

The Engineer / Tư vấn Giám sát
NK-KE-NKV JV

Mẫu số: BBNT 02

ACCEPTANCE MINUTES
BIÊN BẢN NGHIỆM THU

No. (Số):

.....

Date (d/m/yy - ngày, tháng, năm):

Work Item (Hạng mục):

**Soil Investigation borings (Locate borehole's position –
Định vị vị trí lỗ khoan)**

Based on (căn cứ vào):

1. Request No. (Phiếu yêu cầu số:.....)
2. Specifications (Tiêu chuẩn kỹ thuật)
3. Method Statement (Biện pháp thi công)

DESCRIPTION (Nội dung)

No TT	Borehole Tên hố khoan	Station Lý trình	Designed coordinate Tọa độ thiết kế		Actual coordinate Tọa độ thực tế		
			X	Y	X	Y	Z (m)

Comment:

(Nhận xét)

- * The actual borehole's position is approved by the Consultant with Letter No.
(Vị trí thực tế của hố khoan đã được Tư vấn chấp thuận tại thư số)

Conclusion:

(Kết luận)

Approve for acceptance

(Chấp nhận nghiệm thu)

THE CONTRACTOR NHÀ THẦU			THE ENGINEER TƯ VẤN GIÁM SÁT
Prepared by Chuẩn bị	Checked by Kiểm tra	Certified by Xác nhận	Supervised by Giám sát bởi
Site Engineer Kỹ sư công trường	Geotechnical Experts Chuyên gia địa kỹ thuật	Construction Manager Giám đốc thi công	Supervisor Giám sát viên

Hanoi City Ring Road No.3 Construction Project, Mai Dich – South Thang Long Section

Dự án xây dựng đường vành đai 3 – Hà Nội, đoạn Mai Dịch - Nam Thăng Long

The Contractor / Nhà thầu thi công

On behalf of the Employer / Đại diện

The Engineer / Tư vấn Giám sát

**Trading Technology
Construction. JSC(T&C)**

Chủ đầu tư
PMU Thang Long

NK-KE-NKV JV.

Package (Gói thầu):

Work Item (Hạng mục công việc):

Form No.

Station (Lý trình): Km

Soil Investigation / Khảo sát địa chất

GEO-00

Ha Noi, date.....2015

MINUTES OF CHANGING FOR BOREHOLE POSITION

BIÊN BẢN THAY ĐỔI VỊ TRÍ LỖ KHOAN

Borehole No (Lỗ khoan số): Station /lý trình):

1. Participants in the work (Thành phần tham gia gồm có):

- Representative of PMU Inspection Team (Đại diện tổ giám sát của PMU):

Mr/Ông: Position/chức vụ:

Mr/Ông: Position/chức vụ:

- Representative of Consultant (Đại diện tư vấn)

Mr/Ông: Position/chức vụ: Supervisor (Giám sát)

Mr/Ông: Position/chức vụ: Site Engineer (KS hiện trường)

2. Nội dung (Content):

a. Lý do thay đổi (Reason of change):

.....
.....
.....

b. Đề xuất (Propose):

.....
.....
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3. Conclusion (Kết luận):

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**SITE ENGINEER (DRILLING TEAM)
KỸ SƯ HIỆN TRƯỜNG (TỔ KHOAN)**

**SUPERVISOR OF CONSULTANT
GIÁM SÁT CỦA TƯ VẤN**

**INSPECTOR OF PMU
GIÁM SÁT CỦA PMU**

PROJECT MANAGEMENT UNIT THANG LONG
BAN QUẢN LÝ DỰ ÁN THĂNG LONG

DAILY RECORDS
CONSTRUCTION AND QUALITY OF WORKS

NHẬT KÝ
THI CÔNG VÀ CHẤT LƯỢNG CÔNG TRÌNH

No. (Số):

From (từ) to (đến)

Project Title Hanoi City Ring Road No.3 Construction
Project, Mai Dich – South Thang Long
Section

Tên công trình Dự án xây dựng đường vành đai 3 – Hà
Nội, đoạn Mai Dịch - Nam Thăng Long

Date:/...../2015 Temperature:+..... °C Rainy time:h..... Rainfall:mm
 Ngày: Nhiệt độ: Thời gian mưa: Lượng mưa:

Construction items: _____
 Hạng mục thi công: _____

Construction Manager: _____ Signature / Ký tên: _____
 Phụ trách thi công: _____
 Recorded by: _____ Signature / Ký tên: _____
 Ghi nhật ký thi công: _____

Information on Daily Labor and Equipment:

Thông tin về Nhân lực và Máy thi công sử dụng trong ngày:

Engineer: _____ persons Kỹ sư: _____ người	Equipment: Máy thi công: _____ _____ _____
Technician: _____ persons Kỹ thuật: _____ người	
Worker: _____ persons Công nhân: _____ người	
Total: _____ persons	
Tổng số: _____ người	

Time Thời gian	Construction Status Tình hình thi công	Note Ghi chú
Morning (From 0.00 to 12.00 Sáng (từ 0.00 đến 12.00)		
Afternoon (From 12.00 to 24.00 Chiều (từ 12.00 đến 24.00)		

PLAN LOCATION OF BOREHOLE

SƠ HỌA VỊ TRÍ LỖ KHOAN

(BOREHOLE - LỖ KHOAN)

INSPECTION SHEET FOR BORING LOG - PHIẾU KIỂM TRA LỖ KHOAN

Hanoi City Ring Road No.3 Construction Project, Mai Dich – South Thang Long Section

Dự án xây dựng đường vành đai 3 – Hà Nội, đoạn Mai Dịch - Nam Thăng Long

STAGE : WORKING DRAWING DESIGN - GIAI ĐOẠN : THIẾT KẾ BẢN VẼ THI CÔNG

NAME BOREHOLE - TÊN LỖ KHOAN :.....

Hanoi City Ring Road No.3 Construction Project, Mai Dich – South Thang Long Section

Dự án xây dựng đường vành đai 3 – Hà Nội, đoạn Mai Dịch - Nam Thăng Long

The Contractor / Nhà thầu thi công

**Trading Technology
Construction. JSC(T&C)**

On behalf of the Employer

Đại diện Chủ đầu tư
PMU Thang Long

The Engineer / Tư vấn Giám sát

NK-KE-NKV JV

Ha Noi, date 2015

MINUTES OF BOREHOLE BACKFILLING

BIÊN BẢN LẤP LỖ KHOAN

Project: Hanoi City Ring Road No.3 Construction Project, Mai Dich – South Thang Long Section

Tên công trình: Dự án xây dựng đường vành đai 3 – Hà Nội, đoạn Mai Dịch - Nam Thăng Long

Stage/giai đoạn: Shop Drawing/ Bản vẽ thi công

Item/hạng mục: Soil Investigation / Khoan khảo sát địa chất

Consultants/Nhà thầu tư vấn:

Borehole No/ Station (Lỗ khoan số/lý trình):

Package/Gói thầu:

Participative Component including (Chúng tôi gồm những người có tên dưới đây):

TT	Name/Họ và tên	Position/Chức vụ
1		
2		

- Backfilling of borehole is carried out as follows (Trình tự lấp lỗ khoan như sau):

Time Lần thứ	Depth/Độ sâu (m)		Layer / Tên địa tầng (lớp)	Material to backfill/ Vật liệu lấp	Thickness of layer backfilling/ Bề dày lấp(m)	Note/ Ghi chú
	From/Từ	To/Đến				

- Quality Evaluation: (Ensure or not ensure)/Đánh giá chất lượng lỗ khoan (Đã đảm bảo hay không đảm bảo chất lượng lấp lỗ khoan): **Đảm bảo chất lượng.**

THE CONTRACTOR (NHÀ THẦU)			THE ENGINEER (TƯ VẤN)
Prepared by Chuẩn bị	Checked by Kiểm tra	Certified by Xác nhận	Supervised by Giám sát bởi
Site Engineer Kỹ sư công trường	Geotechnical Experts Chuyên gia địa kỹ thuật	Construction Manager Giám đốc thi công	Supervisor Giám sát viên

Hanoi City Ring Road No.3 Construction Project, Mai Dich – South Thang Long Section

Dự án xây dựng đường vành đai 3 – Hà Nội, đoạn Mai Dịch - Nam Thăng Long

The Contractor / Nhà thầu thi công

On behalf of the Employer / Đại diện

The Engineer / Tư vấn Giám sát

Trading Technology
Construction. JSC(T&C)

Chủ đầu tư
PMU Thang Long

NK-KE-NKV JV

Package (Gói thầu):

Work Item (Hạng mục công việc):

Form No.

Station (Lý trình): Km

Soil Investigation / Khảo sát địa chất

GEO-00

Ha Noi, date.....2015

MINUTES OF TAKING WATER SAMPLE

BIÊN BẢN LẤY MẪU NƯỚC

Location (Vị trí): Station /Lý trình):

The participant in the work is named hereinbelow (Chúng tôi gồm những người có tên dưới đây):

- Representative of PMU Inspection Team (Đại diện tổ giám sát của PMU):

Mr/Ông: Position/chức vụ:

Mr/Ông: Position/chức vụ:

- Representative of Consultant (Đại diện tư vấn)

Mr/Ông: Position/chức vụ: Supervisor (Giám sát)

Mr/Ông: Position/chức vụ: Site Engineer (KS hiện trường)

We agreed together the following information (Chúng tôi cùng thống nhất ghi nhận):

- Based on Request of Inspection *RFI No* on date...../..... /2015, the water sample is taken by the Contractor in location of at hour on date/...../2015.

Căn cứ Phiếu yêu cầu giám sát số ngày/..../2015, Nhà thầu đã tiến hành lấy mẫu nước tại vị trí vào lúcgiờ, ngày.../.../ 2015.

- Water sample is taken as follows (Mẫu nước được lấy như sau):

No. STT	Sample Depth (m) Độ sâu lấy mẫu (m)	Quantity (bottle) Số lượng (chai)	Volume (liter) Dung tích (lít)	Note Ghi chú

- Quality Evaluation (Đánh giá chất lượng lấy mẫu nước):

Ensure or not ensure (Đã đảm bảo hay không đảm bảo chất lượng)

SITE ENGINEER (DRILLING TEAM)
KỸ SƯ HIỆN TRƯỜNG (TỔ KHOAN)

SUPERVISOR OF CONSULTANT
GIÁM SÁT CỦA TƯ VẤN

INSPECTOR OF PMU
GIÁM SÁT CỦA PMU

Hanoi City Ring Road No.3 Construction Project, Mai Dich – South Thang Long Section

Dự án xây dựng đường vành đai 3 – Hà Nội, đoạn Mai Dịch - Nam Thăng Long

The Contractor / Nhà thầu thi công

On behalf of the Employer / Đại diện

The Engineer / Tư vấn Giám sát

Trading Technology
Construction. JSC(T&C)

Chủ đầu tư
PMU Thang Long

NK-KE-NKV JV

Package (Gói thầu):

Work Item (Hạng mục công việc):

Form No.

Station (Lý trình): Km

Soil Investigation / Khảo sát địa chất

GEO-00

Ha Noi, date.....2015

MINUTES OF HAND OVER SAMPLES TO LABORATORY
BIÊN BẢN BÀN GIAO MẪU THÍ NGHIỆM

Item (Hạng mục):

Laboratory (Địa điểm thí nghiệm):

Address (Địa chỉ):

1. Participants in hand over (Thành phần trực tiếp giao nhận):

a) Hand over samples by (Đơn vị giao mẫu):

Mr. (Ông): Posiotion (Chức vụ):.....

b) Received samples by (Đơn vị nhận mẫu):

Mr. (Ông): Posiotion (Chức vụ):.....

2. Representative of Consultant (Đại diện Tư vấn):

Mr. (Ông): Posiotion (Chức vụ):.....

Mr. (Ông): Posiotion (Chức vụ):.....

3. Representative of PMU (Đại diện Tổ giám sát của PMU):

Mr. (Ông): Posiotion (Chức vụ):.....

Mr. (Ông): Posiotion (Chức vụ):.....

4. Time for hand over (Thời gian giao nhận):

Begining (Bắt đầu):.....hour (giờ).....date (ngày)...../...../ 2015

Finished (Kết thúc):.....hour (giờ).....date (ngày)...../...../ 2015

5. Quantity and Quality of Sample (Số lượng, chất lượng mẫu):

a. Quantity of Sample (Số lượng mẫu):

Sample of Borehole (Mẫu của các lỗ khoan):.....

.....

.....

In which (trong đó):

- Thin-wall sample (Mẫu thành mỏng):

- Undisturbed Sample (Mẫu nguyên dạng):

- Disturbed sample (Mẫu không nguyên dạng):.....

- Split Spoon sample (Mẫu SPT):.....
- b. Quality of Sample (Chất lượng mẫu):
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.....
- c. Other comments (Các ý kiến khác):
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.....

REPRESENTATIVE OF DRILLING TEAM
ĐẠI DIỆN ĐƠN VỊ GIAO MẪU

REPRESENTATIVE OF LABORATORY
ĐẠI DIỆN ĐƠN VỊ NHẬN MẪU

REPRESENTATIVE OF CONSULTANT
ĐẠI DIỆN TƯ VẤN

REPRESENTATIVE OF PMU
ĐẠI DIỆN CHỦ ĐẦU TƯ

Hanoi City Ring Road No.3 Construction Project, Mai Dich – South Thang Long Section
Dự án xây dựng đường vành đai 3 – Hà Nội, đoạn Mai Dịch - Nam Thăng Long

The Contractor /Nhà thầu thi công Trading Technology Construction. JSC(T&C)	On behalf of the Employer / Đại diện Chủ đầu tư PMU Thang Long	The Engineer / Tư vấn Giám sát NK-KE-NKV JV
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Package (Gói thầu): Station (Lý trình): Km	Work Item (Hạng mục công việc): Soil Investigation / Khảo sát địa chất	Form No. GEO-03
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Ha Noi, date.....,..... 2015

MINUTES OF COMPLETION FOR DRILLED BOREHOLE
BIÊN BẢN NGHIỆM THU KẾT THÚC LỖ KHOAN

Borehole No (Lỗ khoan số): Station /lý trình):

1. The participant in the work is named herein below (Thành phần tham gia nghiệm thu):

- The Employer (Chủ đầu tư)

Mr/Ông: Position/chức vụ:

Mr/Ông: Position/chức vụ:

- Representative of Consultant (Đại diện tư vấn)

Mr/Ông: Position/chức vụ:

Mr/Ông: Position/chức vụ:

-The contractor for Construction Survey Work (Nhà thầu khảo sát xây dựng)

Mr/Ông: Position/chức vụ:

Mr/Ông: Position/chức vụ:

2. Content:

Based on the applied Standards and Technical Specification of Soil Investigation, we together agreed the following contents (Căn cứ các quy trình được áp dụng và đề cương khoan, chúng tôi đã thống nhất những nội dung sau đây):

a) Advantage (Ưu điểm):

Note completely and clearly the works, which are in accordance with Standard and Technical Specification of Soil Investigation (nêu rõ và đầy đủ tất cả các sự việc đã được thực hiện đúng quy trình và đề cương khoan).

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b) Defect (Khuyết điểm):

Note completely and clearly the works, which are not in accordance with Standard and Technical Specification of Soil Investigation (Nêu rõ và đầy đủ những sự việc chưa thực hiện đúng quy trình và đề cương khoan).

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3. Conclusion (Kết luận):

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4. Appendixes are attached hereinafter (Phụ lục đính kèm biên bản này gồm)

- a) Field Boring Log (Nhật ký và hình trụ hố khoan hiện trường)
- b) Photographs while drilling (Hình ảnh chụp quá trình khoan)
- c) Others (if any)/Các phụ lục khác (nếu có)

CONTRACTOR
(NHÀ THẦU)

THE CONSULTANT
(TƯ VẤN DỰ ÁN)

THE EMPLOYER
(CHỦ ĐẦU TƯ)