

PILE ENGINEERING & CONSTRUCTION

Engineering & Construction Company for Plant,
Civil, and Building Infrastructure



Building a Safer Korea Against **Earthquakes**
T.SHARE Construction Leads the Way.

Tech Share Construction Company

T-Share Construction is strengthening its capabilities in the construction sector through creative and innovative technologies. We aim to be a trusted company that enhances construction value and prioritizes the customer.

We promise to deliver optimal construction methods and the highest quality based on fundamentals and principles.



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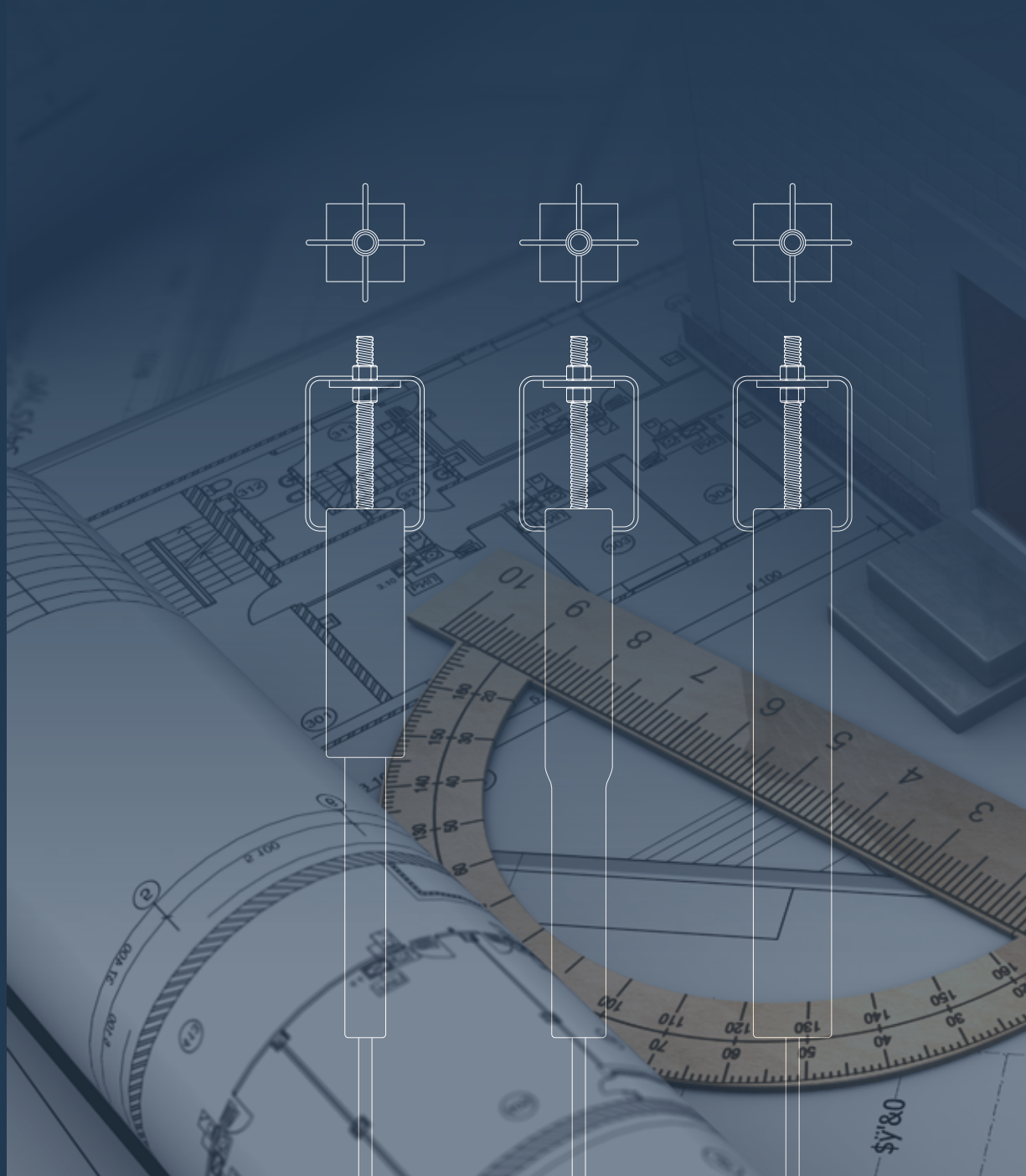
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COMPOSITE
MICROPILE

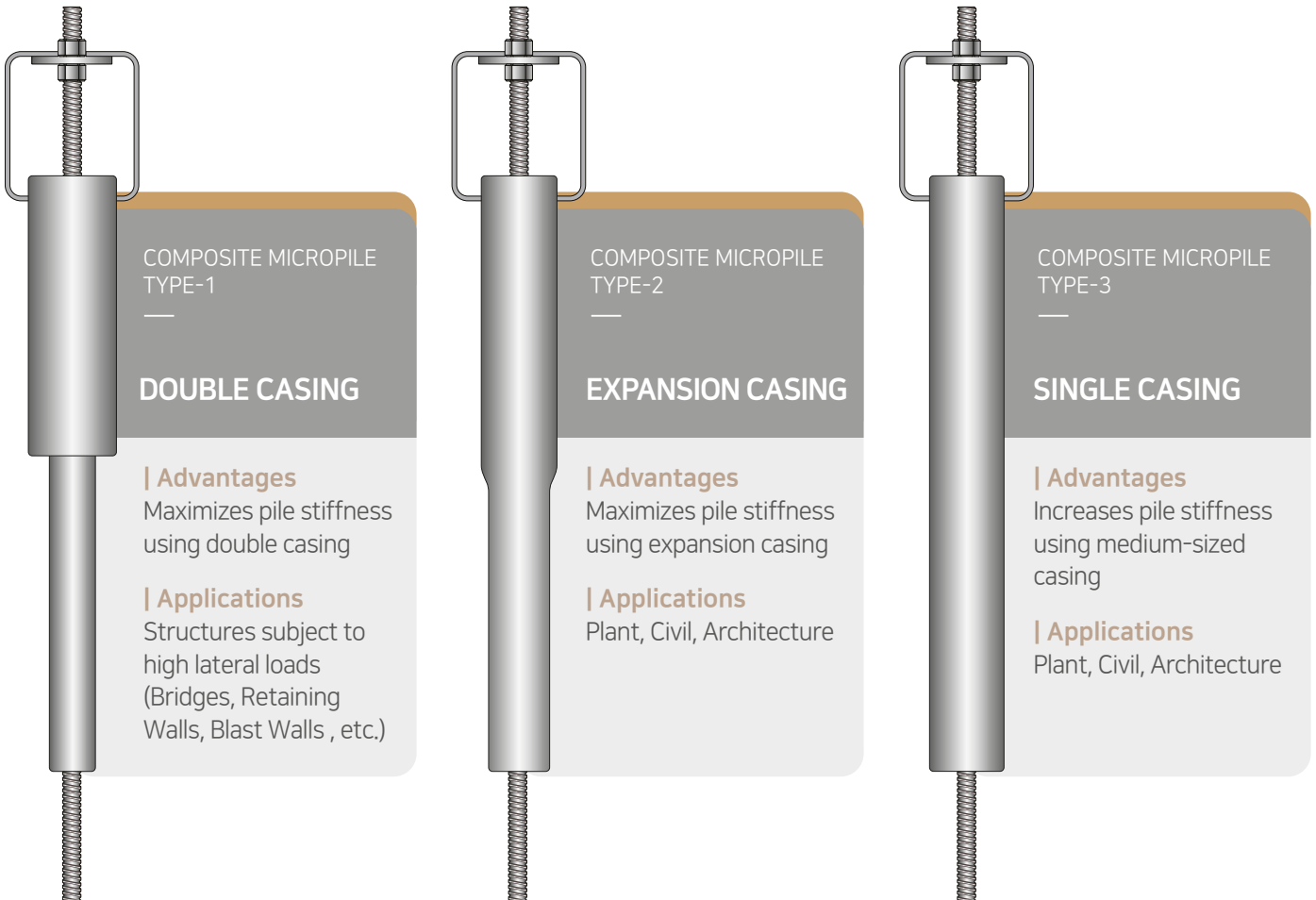


COMPOSITE MICROPILE

Composite Micropile (CMP)

A New Paradigm for Small-Diameter Piles

A high-performance, small-diameter seismic pile that enhances bending and shear capacity



Design Criteria

Bridge Substructure Design Criteria (KDS 24 14 50)
Connection between Pile and Pile Cap

Design of bridge foundations shall be rigid connections in principle.

The connection between the pile and the pile cap shall be designed to resist all external forces acting on the pile head, including compression, uplift (tension), lateral force, and moment.

Railway Design Criteria (Subgrade, 2015)
Connection between Pile and Pile Cap

Design of bridge foundations shall be rigid connections in principle.

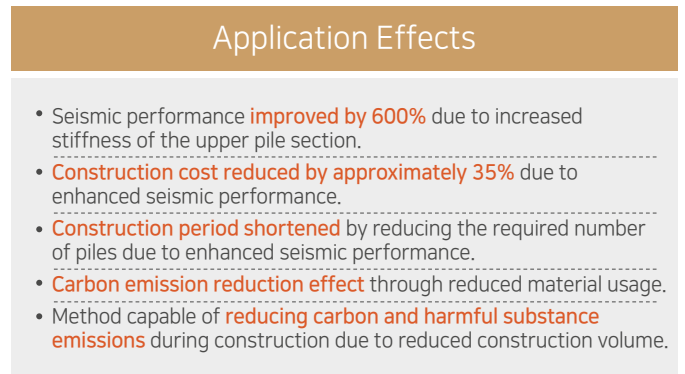
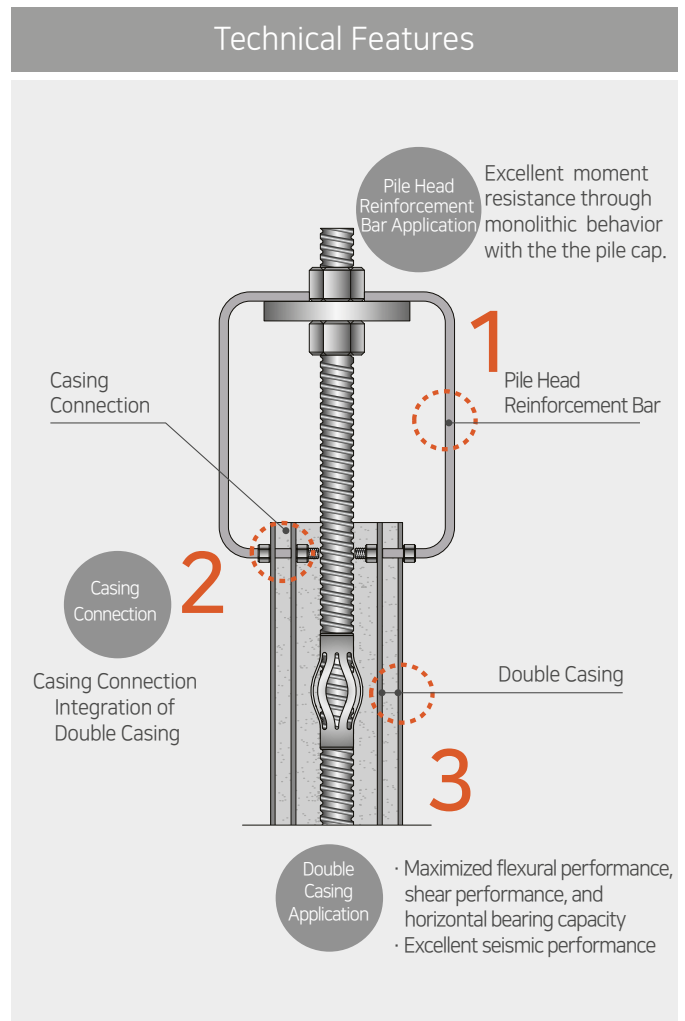
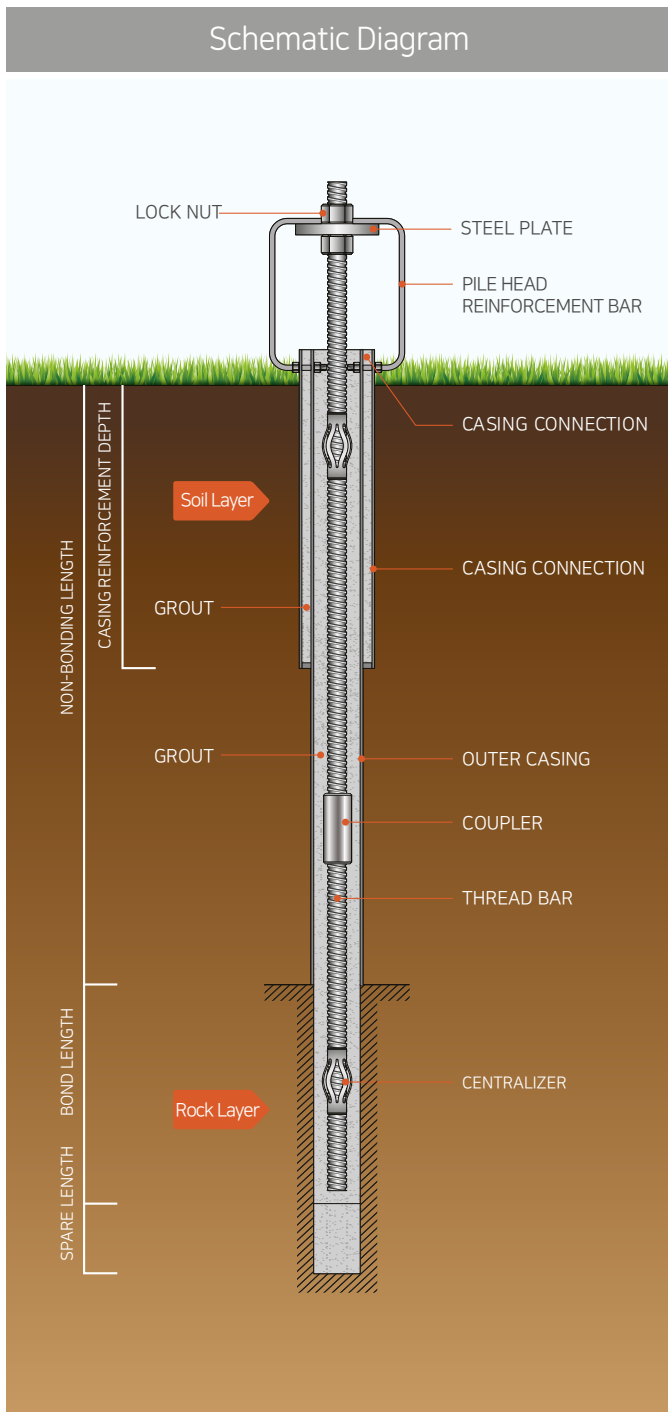
The connection between the pile and the pile cap shall be designed to resist all external forces acting on the pile head, including compression, uplift (tension), lateral force, and moment.

TYPE 1

DOUBLE CASING

New Concept Micropile System featuring a double casing at the pile head to maximize lateral resistance.

Method Outline



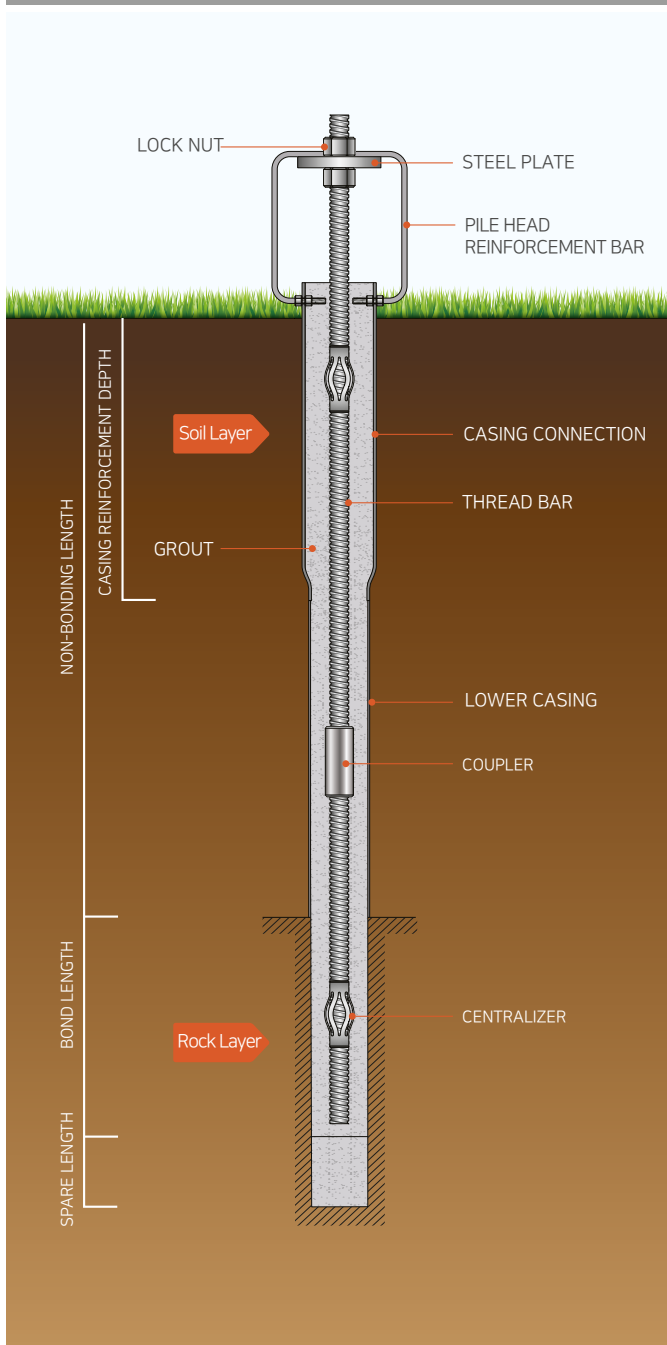
TYPE 2

EXPANSION CASING

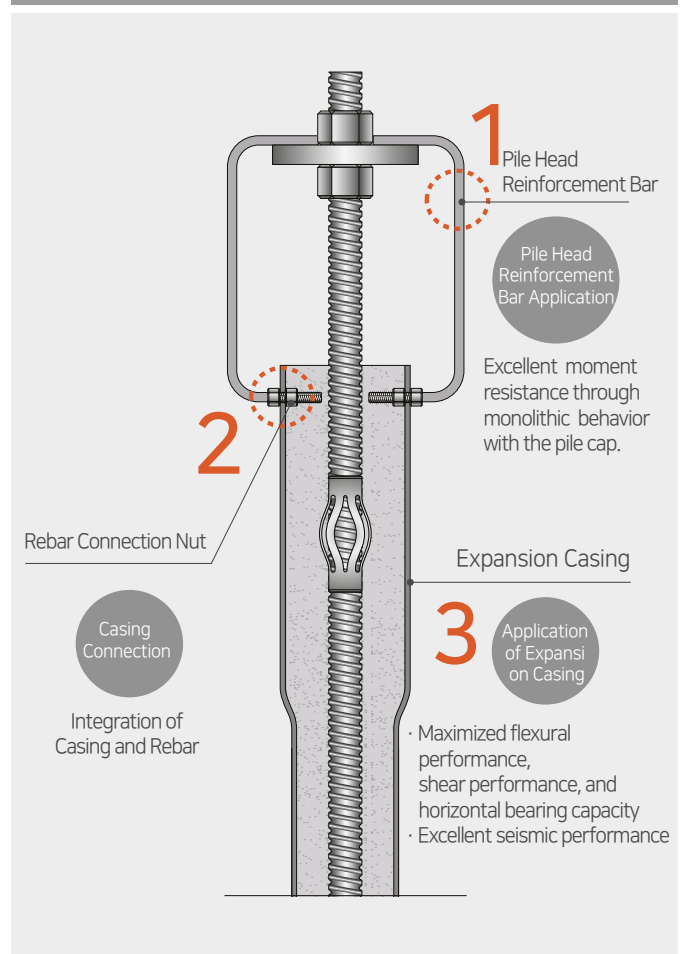
New Concept Micropile System featuring a expansion casing at the pile head to maximize lateral resistance.

Method Outline

Schematic Diagram



Technical Features



Application Effects

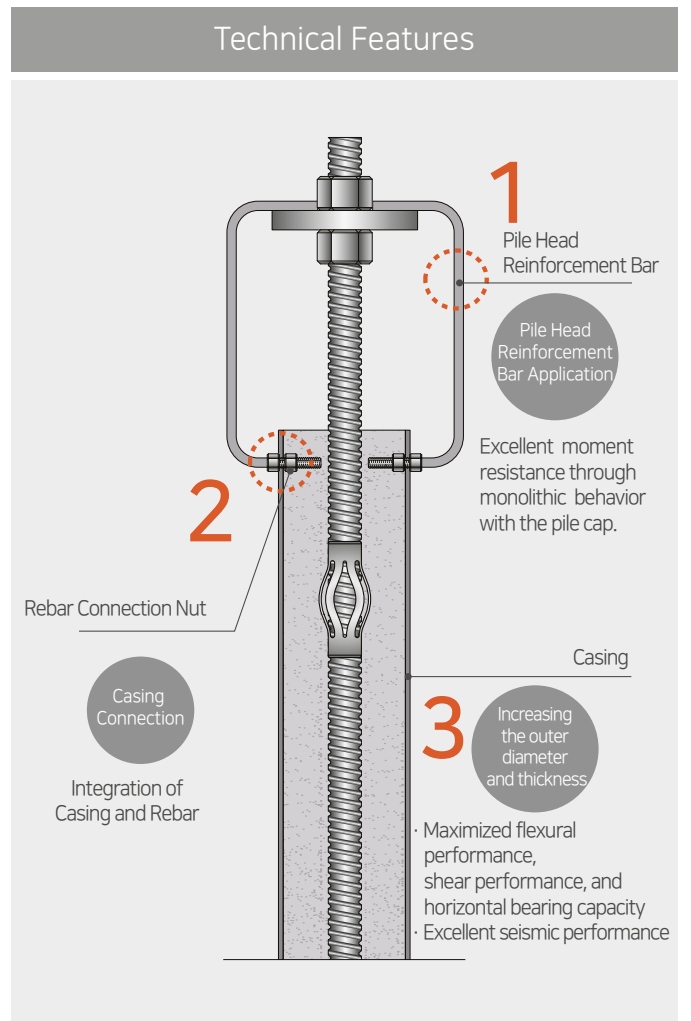
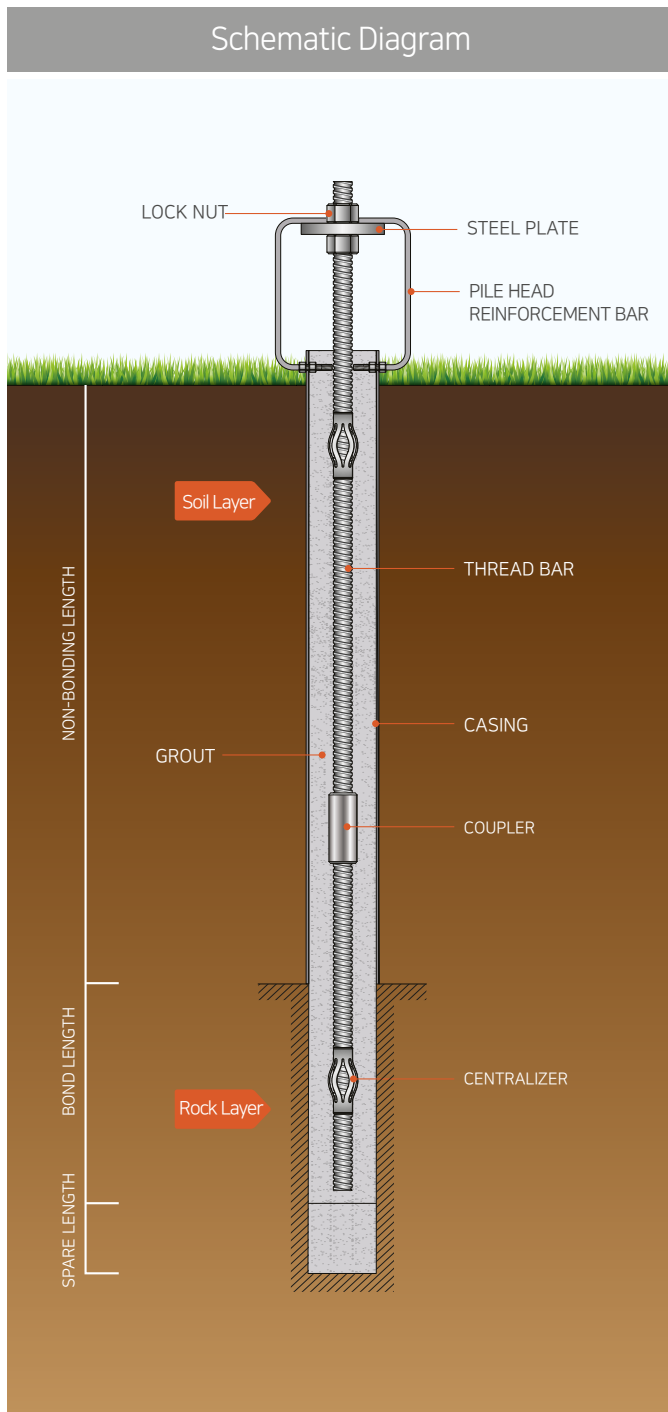
- Seismic performance **improved by 310%** due to increased stiffness of the upper pile section.
- **Construction cost reduced** due to enhanced seismic performance.
- **Construction period shortened** by reducing the required number of piles due to enhanced seismic performance.
- **Carbon emission reduction effect** through reduced material usage.
- Method capable of **reducing carbon and harmful substance emissions** during construction due to reduced construction volume.

TYPE 3

SINGLE CASING

A new concept micropile method that enhances horizontal bearing capacity by increasing the outer diameter and thickness of the steel casing/pipe.

System Overview



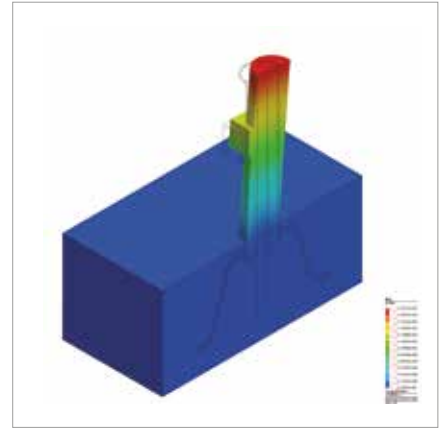
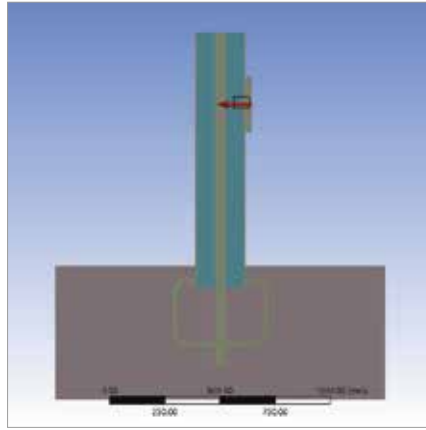
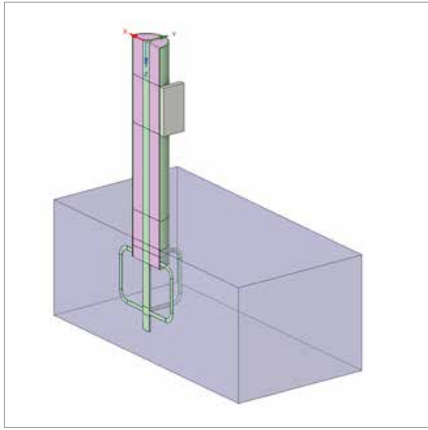
- ### Application Effects
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 - **Carbon emission reduction effect** through reduced material usage.
 - Method capable of **reducing carbon and harmful substance emissions** during construction due to reduced construction volume.

Main Materials

| Classification | | Specifications | | | | |
|-------------------------|---|--|----------------------|---|---------------------------------|-------------------------------------|
| | | Steel Grade (N/mm ²) | Diameter (mm) | Cross-sectional Area (mm ²) | Yield Load F _y (ton) | Allowable Load F _a (ton) |
| THREAD BAR |  | SS500 | 50 | 1,962 | 100.0 | 57.1 |
| | | | 65 | 3,316 | 169.0 | 96.6 |
| | | | 75 | 4,415 | 225.0 | 128.6 |
| STEEL PIPE |  | SS275 | Ø165(4.5t) | | | |
| | | | Ø216(4.5t/6.0t/8.2t) | | | |
| | | | Ø267(6.0t/9.3t) | | | |
| | | | Ø318(7.0t/10.3t) | | | |
| STEEL PLATE |  |  | mm | | | |
| | | | BAR Φ | 75 | 65 | 50 |
| A | 450 | 350 | 300 | | | |
| B | 85 | 75 | 60 | | | |
| t | 35 | 30 | 30 | | | |
| LOCK NUT |  |  | mm | | | |
| | | | Size (Φ) | 75 | 65 | 50 |
| Length (L) | 90 | 80 | 70 | | | |
| Outer Diameter (D) | 120 | 100 | 80 | | | |
| COUPLER |  |  | mm | | | |
| | | | Size (Φ) | 75 | 65 | 50 |
| Length (L) | 180 | 180 | 160 | | | |
| Outer Diameter (D) | 120 | 100 | 80 | | | |
| CENTRALIZER |  |  | mm | | | |
| | | | Size (Φ) | 75 | 65 | 50 |
| A | 140 | 140 | 124 | | | |
| L | 290 | 290 | 290 | | | |
| L' | 48 | 48 | 48 | | | |
| W | 80 | 80 | 60 | | | |
| REINFORCEMENT STEEL BAR |  | | | | | |

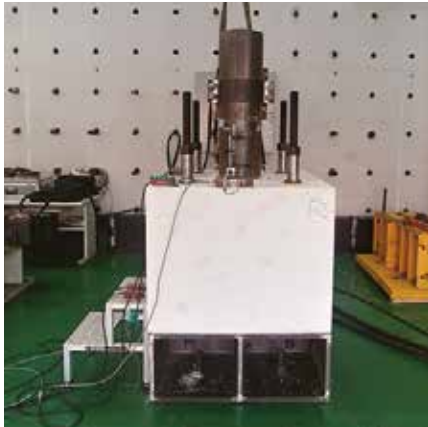
Seismic Performance Evaluation of Enlarged Footing Connection

3D Structural Analysis



3D Analysis Model

Seismic Performance Evaluation



1st Performance Evaluation in 2019



2nd Performance Evaluation in 2022



3rd Performance Evaluation in 2023

Performance Evaluation Results

The composite micropile is evaluated to have excellent seismic performance due to its high ductility and ability to maintain continuous strength even after the maximum load is generated.

TEST REPORT (Certificate of Test)
Test Certification by Korea Testing & Research Institute (KTR)



Compressive Strength Evaluation of Expansion Upper Casing

3D Structural Analysis



Load, Boundary Conditions



Von Mises Stress and Strain



Compressive Strength Evaluation



Compressive Strength Evaluation of Expansion Upper Casing

Performance Evaluation Results

The maximum axial compressive strength of the test specimen is evaluated to be excellent, exceeding 125% of the design compressive strength.

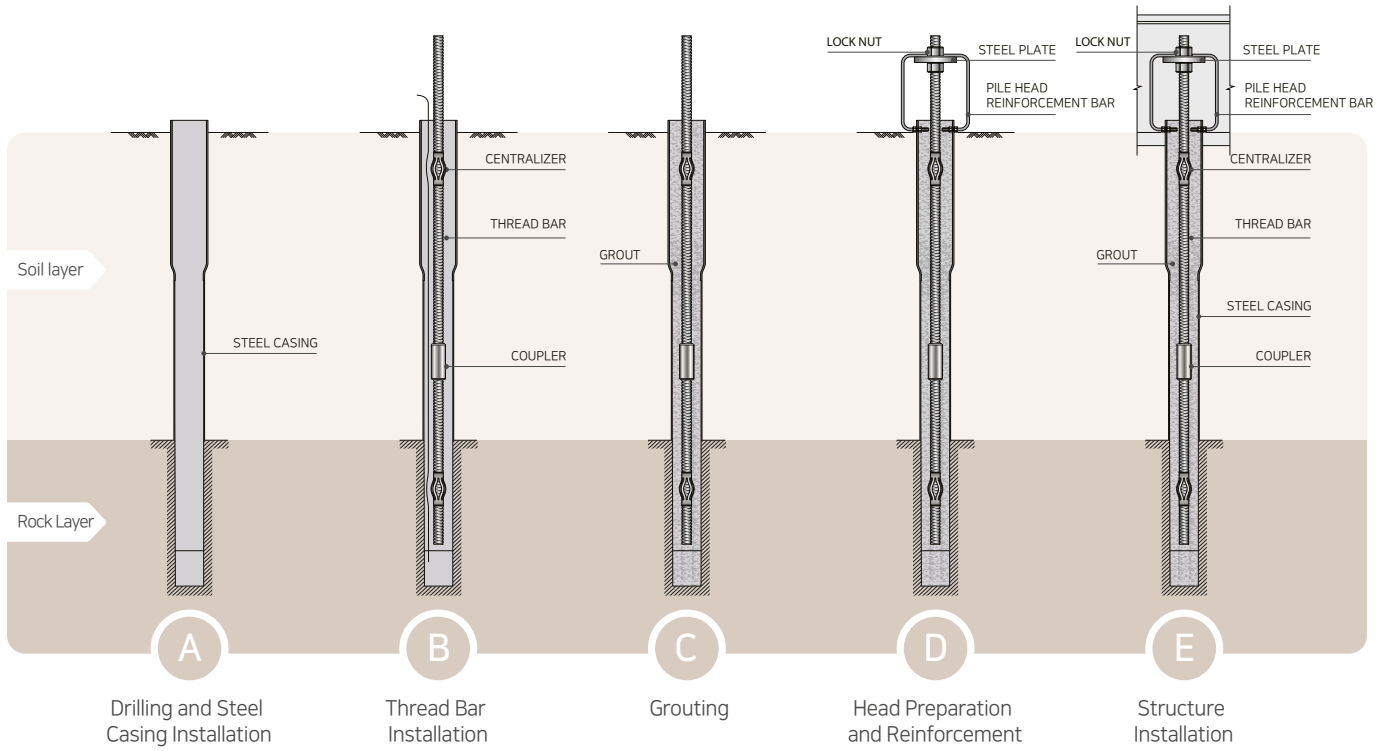
TEST REPORT (Certificate of Test)
 Test Certification by Korea Testing & Research Institute (KTR)



Performance and Economics

| Type | Composite Micropile (Double Casing) | Composite Micropile (Expansion Casing/Single Casing) | Micropile |
|----------------------------|--|--|---|
| Schematic Diagram | <p>● Pile Head Reinforcement Bar ● Double Casing</p> | <p>● Pile Head Reinforcement Bar ● Double Casing</p> | |
| Method Features | <ol style="list-style-type: none"> Applicable to areas where large equipment entry is difficult or working space is restricted Application of Double Casing ▶ 600% Improvement in Seismic Performance Application of Head Reinforcement (Pile Head Fixation) Construction cost reduction through improved seismic performance | <ol style="list-style-type: none"> Applicable to areas where large equipment entry is difficult or working space is restricted Single Casing - Increased Casing Diameter and Thickness ▶ 310% Improvement in Seismic Performance Application of Head Reinforcement (Pile Head Fixation) Construction cost reduction through improved seismic performance | <ol style="list-style-type: none"> Applicable to areas where large equipment entry is difficult or working space is restricted Application of Single Casing ▶ Reduced Seismic Performance Non-application of Head Reinforcement (Pile Head Hinge) Excessive Construction Cost due to deteriorated Seismic Performance |
| Allowable Bearing Capacity | <ul style="list-style-type: none"> Allowable Vertical Bearing Capacity : 65.0 ton 600% Improvement in Allowable Horizontal Bearing Capacity | <ul style="list-style-type: none"> Allowable Vertical Bearing Capacity : 65.0 ton 310% Improvement in Allowable Horizontal Bearing Capacity | <ul style="list-style-type: none"> Allowable Vertical Bearing Capacity : 65.0 ton Allowable Horizontal Bearing Capacity: 100% |
| Performance / Price | <p> ■ Composite Micropile(Double Casing) ■ Composite Micropile(Expansion Casing) ■ Micropile </p> <p> Performance: 310% Improvement (up arrow) Construction cost: 35% reduction (down arrow) </p> <p>* Note : Comparison is based on the performance/price of conventional micropile.</p> | | |

Construction Sequence



Application Sectors

Plant Sectors



Bridge Sectors



Civil / Architecture / Port Sectors



Major Clients



Major Projects

| No | Project Name | Country/Location | Owner | Work Category |
|----|--|------------------------------|--------------------------------|-------------------------------|
| 1 | Daegu Eco-Friendly Energy Project | Republic of Korea / Daegu | Korea Distric Heating Corp. | Piperack |
| 2 | Cheongju Eco-Friendly Energy Project | Republic of Korea / Cheongju | Korea Distric Heating Corp. | Piperack |
| 3 | Kumho Petrochemical SCR Structure Constrcution | Republic of Korea / Yeosu | Kumho Petrochemical | Equipment Structure |
| 4 | LG Chemical SCR Structure Construction | Republic of Korea / Yeosu | LG Chemical | Equipment Structure |
| 5 | LG Chemical PVC SL-3 Project | Republic of Korea / Yeosu | LG Chemical | Equipment |
| 6 | LG Chemical CNT Project | Republic of Korea / Yeosu | LG Chemical | Equipment |
| 7 | LG Chemical NPG Project | Republic of Korea / Yeosu | LG Chemical | PKG Equipment |
| 8 | LG Chemical ABS2 Project | Republic of Korea / Yeosu | LG Chemical | Equipment |
| 9 | LG Chemical CNT3 Project | Republic of Korea / Yeosu | LG Chemical | Equipment & C3 Auto WareHouse |
| 10 | LG Chemical ABS2 Waste Heat Recovery Project | Republic of Korea / Yeosu | LG Chemical | Equipment Structure |
| 11 | LG Chemical 3AA Project | Republic of Korea / Yeosu | LG Chemical | PKG Equipment |
| 12 | Hanwha Solutions Equipment & Steel Strucutre Foundation Construction | Republic of Korea / Yeosu | Hanwha Solutions | Piperack |
| 13 | LG Chemical PBAT Product Development Project | Republic of Korea / Yeosu | LG Chemical | PBAT Building |
| 14 | LG Chemical Chungbang North Gate Expansion Project | Republic of Korea / Yeosu | LG Chemical | P/R Overbridge |
| 15 | LG Chemical Cogeneration Auxiliary Boiler Steam Back Up Stabilization Construction Project (Civil Engineering) | Republic of Korea / Yeosu | LG Chemical | Stack Equipment |
| 16 | LG Chemical U3 Pure Facility Investment Civil and Architectural Construction | Republic of Korea / Yeosu | LG Chemical | Tank Equipment |
| 17 | LG Chemical Huach LDPE Piperack Expansion Project | Republic of Korea / Yeosu | LG Chemical | Piperack |
| 18 | Namhae Chemical Sulfuric Acid Plant 650# Back Pressure Steam Turbine Generator Installation Project | Republic of Korea / Yeosu | Namhae Chemical | Turbine(Vibration) |
| 19 | Yeosu-Gwangyang Port Authority Piperack Foundation Work | Republic of Korea / Yeosu | Yeosu-Gwangyang Port Authority | Piperack |
| 20 | Dasan Hyundai Oilbank HDO Units 3 and 9 Desulfurization Facility Construction Project | Republic of Korea / Seosan | Hyundai Oilbank | BAG House, Reactor & Silo |
| 21 | GS Caltex PP Process Recovery Process Heat Exchanger Replacement Project | Republic of Korea / Yeosu | GS Caltex | Equipment |
| 22 | Daesan Hyundai Oilbank OCB Expansion Project | Republic of Korea / Seosan | Hyundai Oilbank | BLDG |
| 23 | Daesan Hyundai Oilbank LBO Expansion Project | Republic of Korea / Seosan | Hyundai Oilbank | Equipment |
| 24 | Daesan Hyundai Oilbank FGRU Project | Republic of Korea / Seosan | Hyundai Oilbank | PKG Equipment |

Intellectual Property Rights

Patents (Domestic)



Patents (Overseas)



Design Registrant



Trademark



Copyright

Design Drawings



Structural Analysis Report



| Certifications & Awards



Venture Business



Employee Invention Compensation Excellent Enterprise



Department Dedicated to R&D



Excellent Patent Award



ISO 9001:2015



ISO 14001:2015



ISO 45001:2018

