ALTERNATIVAS ECOLÓGICAS COMO SOLUCIÓN A PROBLEMAS DE CONTENCIÓN DE TIERRA

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1955 - Zwolle


wavin | academy
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Plastic
Road
PAVCO wavin
PLASTIC VANGER

Desarrollando la infraestructura para las futuras generaciones

CONSTRUYENDO ENTORNOS SALUDABLES Y SOSTENIBLES

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orbia

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Impacto social

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+ Durabilidad

ESTRUCTURAS DE CONTENCIÓN

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México
Haití
República Dominicana
Cuba
Honduras
(*) Puerto Rico (EE. UU.)
Nicargaua
Guatemala
El Salvador
Costa Rica
Panamá
Venezuela
(*) Guayana Francesa (Francia)
Colombia
Ecuador
Brasil
Perú
Bolivia
Chile
Argentina
Paraguay
Uruguay


COSTA RICA
PURA VIDA
NO EJÉRCITO
BIODIVERSIDAD

Comunicados · 5 octubre 2018 · 1 Minuto de lectura

COSTA RICA SUPERA 98% DE GENERACIÓN ELÉCTRICA RENOVABLE POR CUARTO AÑO CONSECUTIVO

ICE proyecta que respaldo térmico será necesario en casos excepcionales durante el resto del año.

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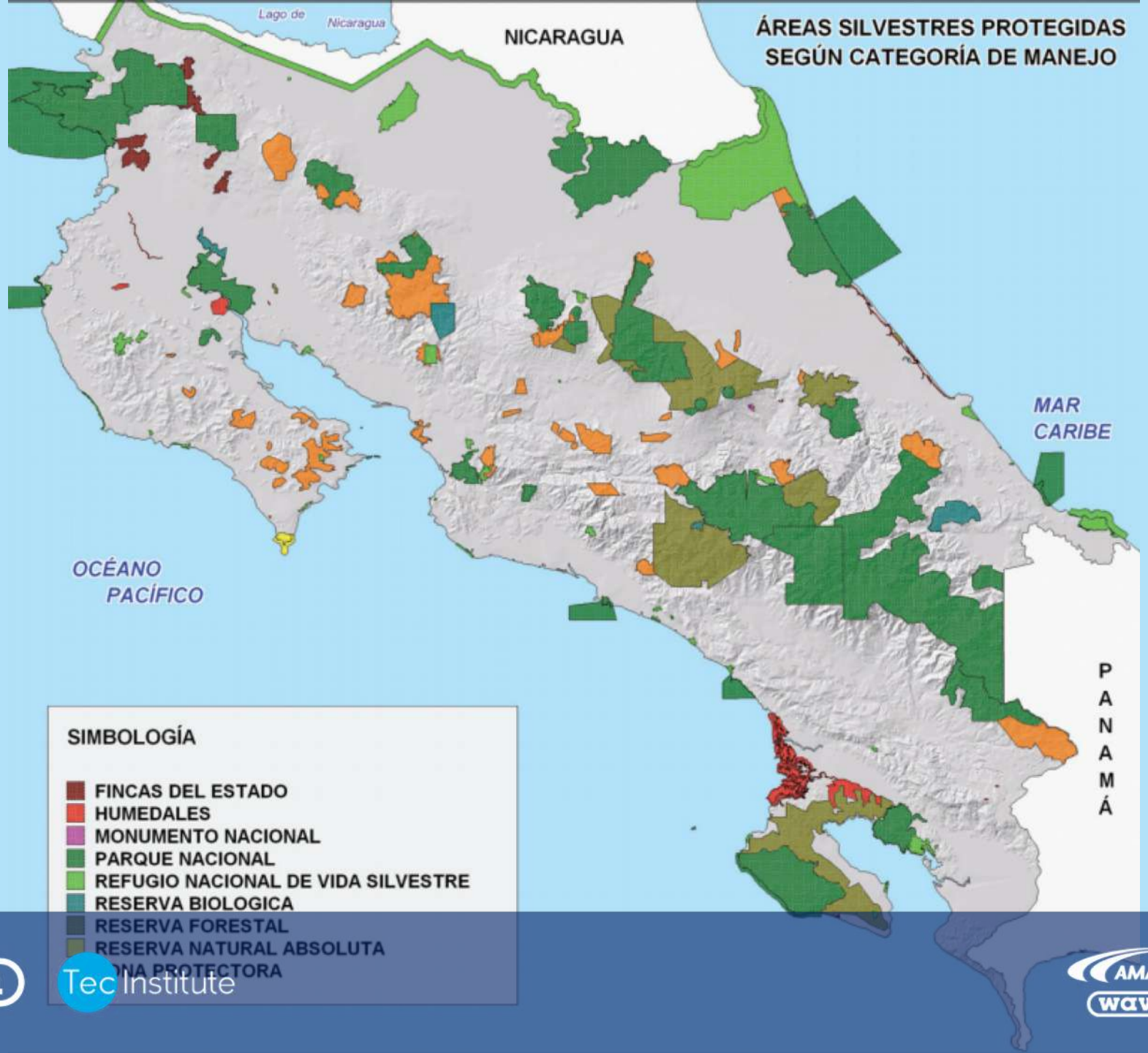

20 %

Territorio
áreas protegidas

29

Parques Nacionales

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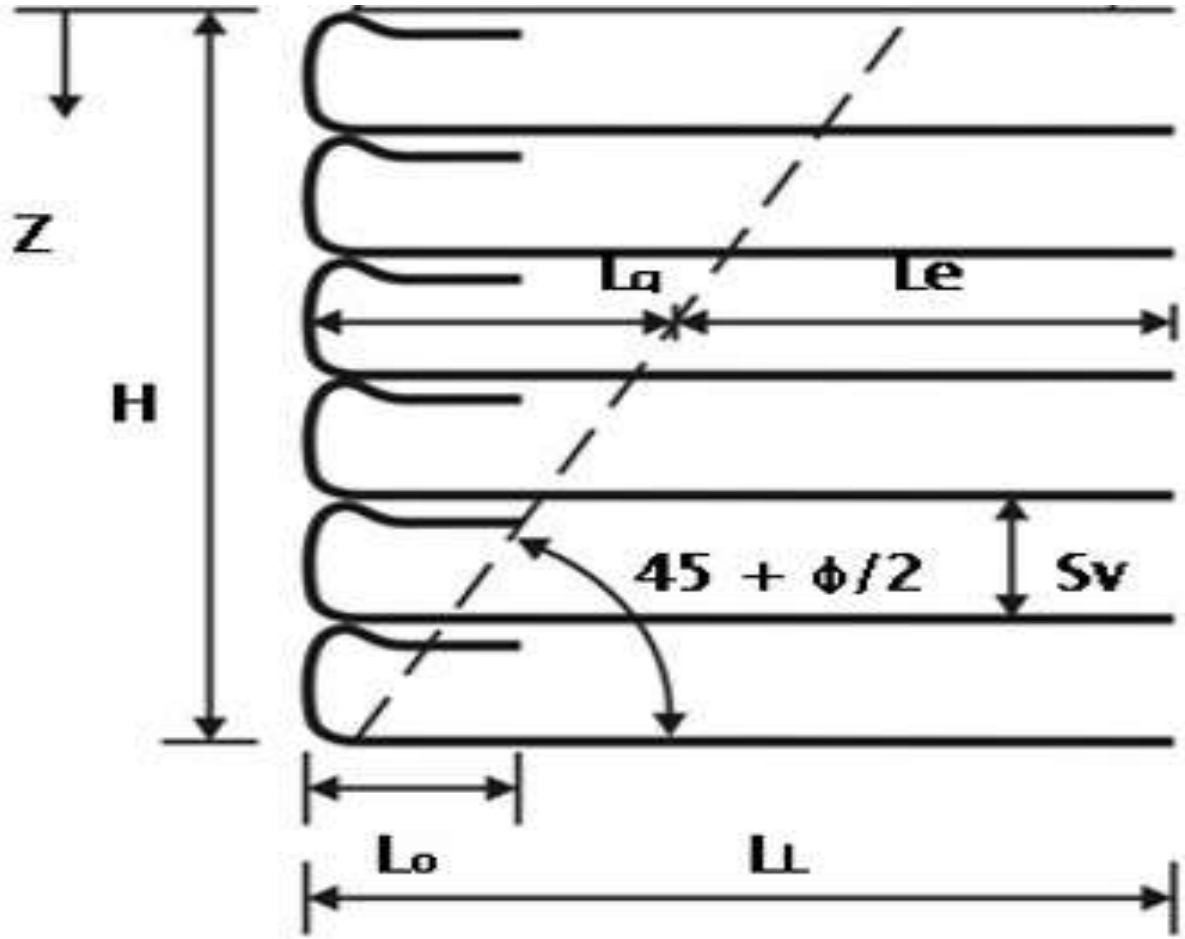
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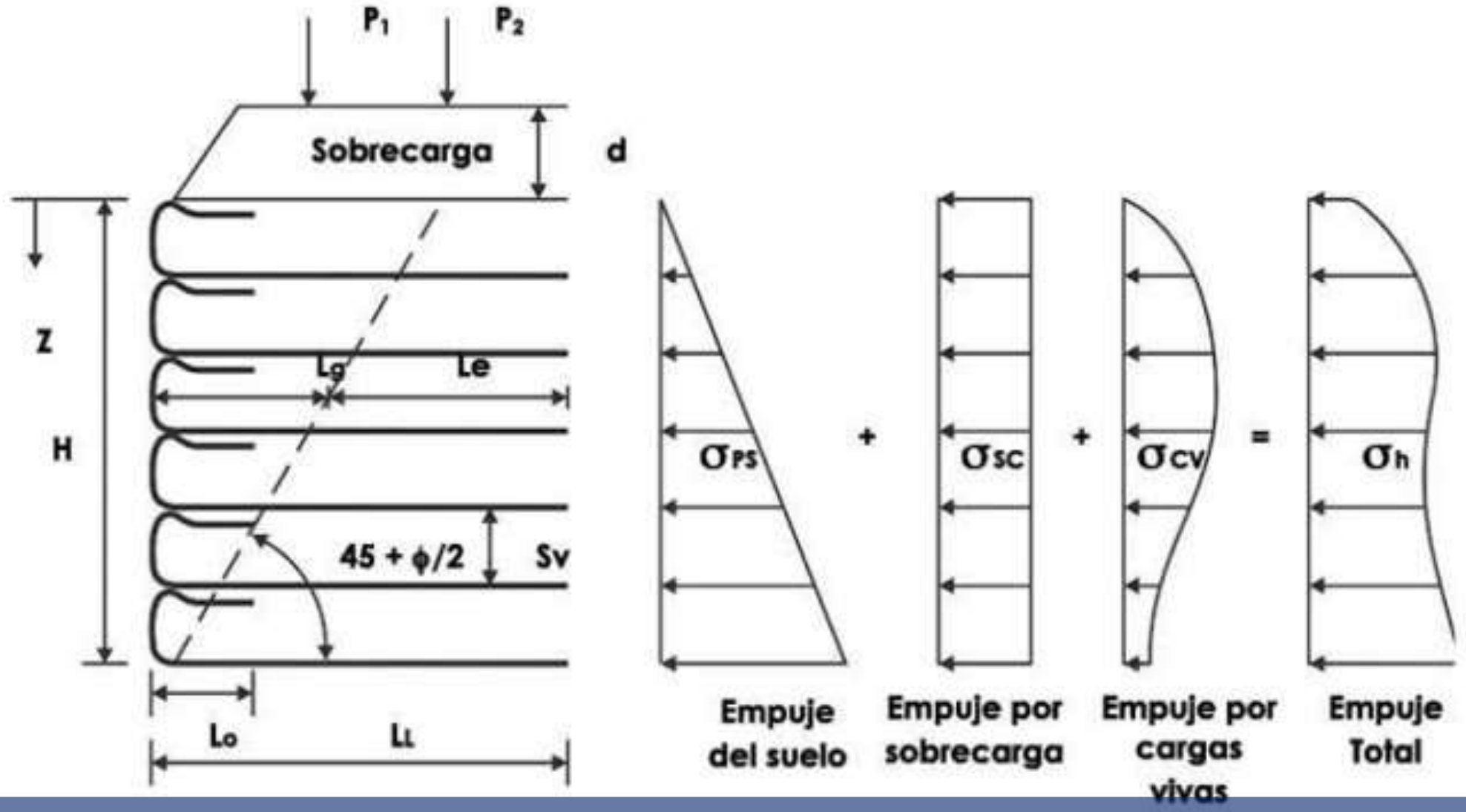
45 + ϕ/2
Sv
Lo
LL


P1
P2
Sobrecarga
d
Z
H
Lg
Le
45 + ϕ/2
Sv
Lo
LL
σPS
+
σSC
+
σCV
=
σh
Empuje del suelo
Empuje por sobrecarga
Empuje por cargas vivas
Empuje Total

Fricción

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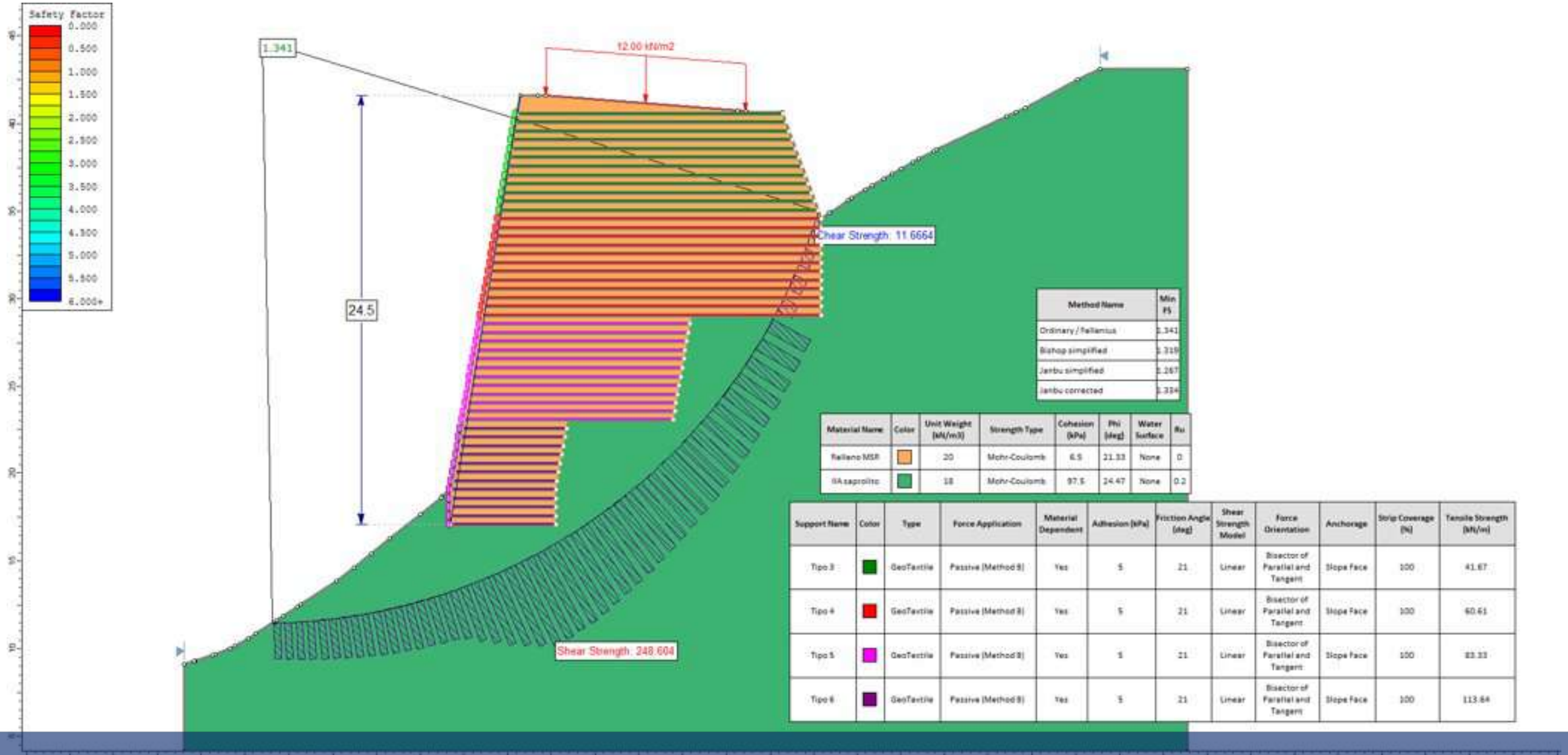

Method Name	Min FS
Ordinary / fellenius	1.341
Bishop simplified	1.319
Janbu simplified	1.267
Janbu corrected	1.334

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
Italiano MSR		20	Mohr-Coulomb	6.5	21.33	None	0
IIA saprolito		18	Mohr-Coulomb	97.5	24.47	None	0.2

Support Name	Color	Type	Force Application	Material Dependent	Adhesion (kPa)	Friction Angle (deg)	Shear Strength Model	Force Orientation	Anchorage	Strip Coverage (%)	Tensile Strength (kN/m)
Tipo 3		GeoTextile	Passive (Method B)	Yes	5	21	Linear	Bisector of Parallel and Tangent	Slope Face	100	41.67
Tipo 4		GeoTextile	Passive (Method B)	Yes	5	21	Linear	Bisector of Parallel and Tangent	Slope Face	100	60.61
Tipo 5		GeoTextile	Passive (Method B)	Yes	5	21	Linear	Bisector of Parallel and Tangent	Slope Face	100	83.33
Tipo 6		GeoTextile	Passive (Method B)	Yes	5	21	Linear	Bisector of Parallel and Tangent	Slope Face	100	113.64

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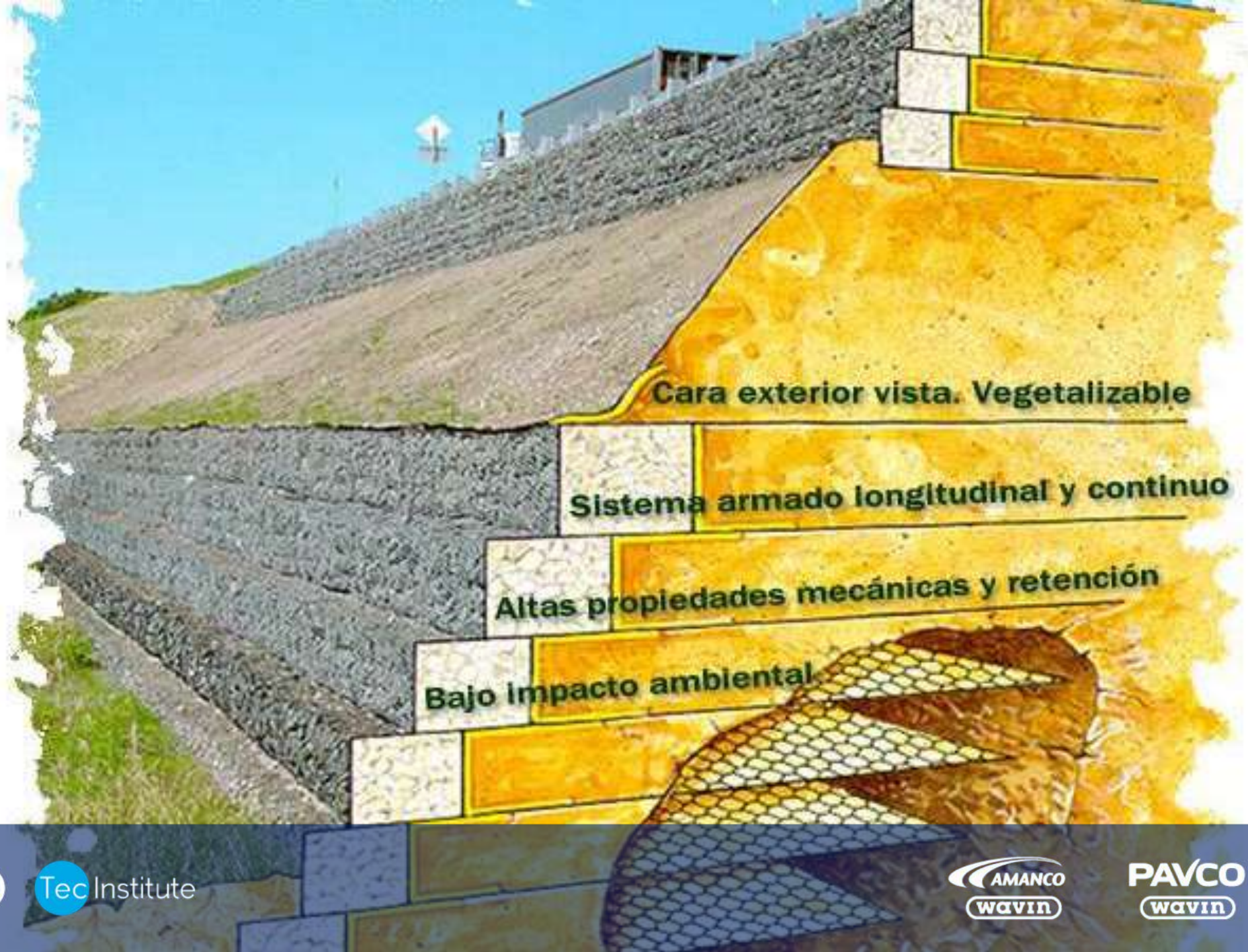
Cara exterior vista. Vegetalizable
Sistema armado longitudinal y continuo
Altas propiedades mecánicas y retención
Bajo impacto ambiental

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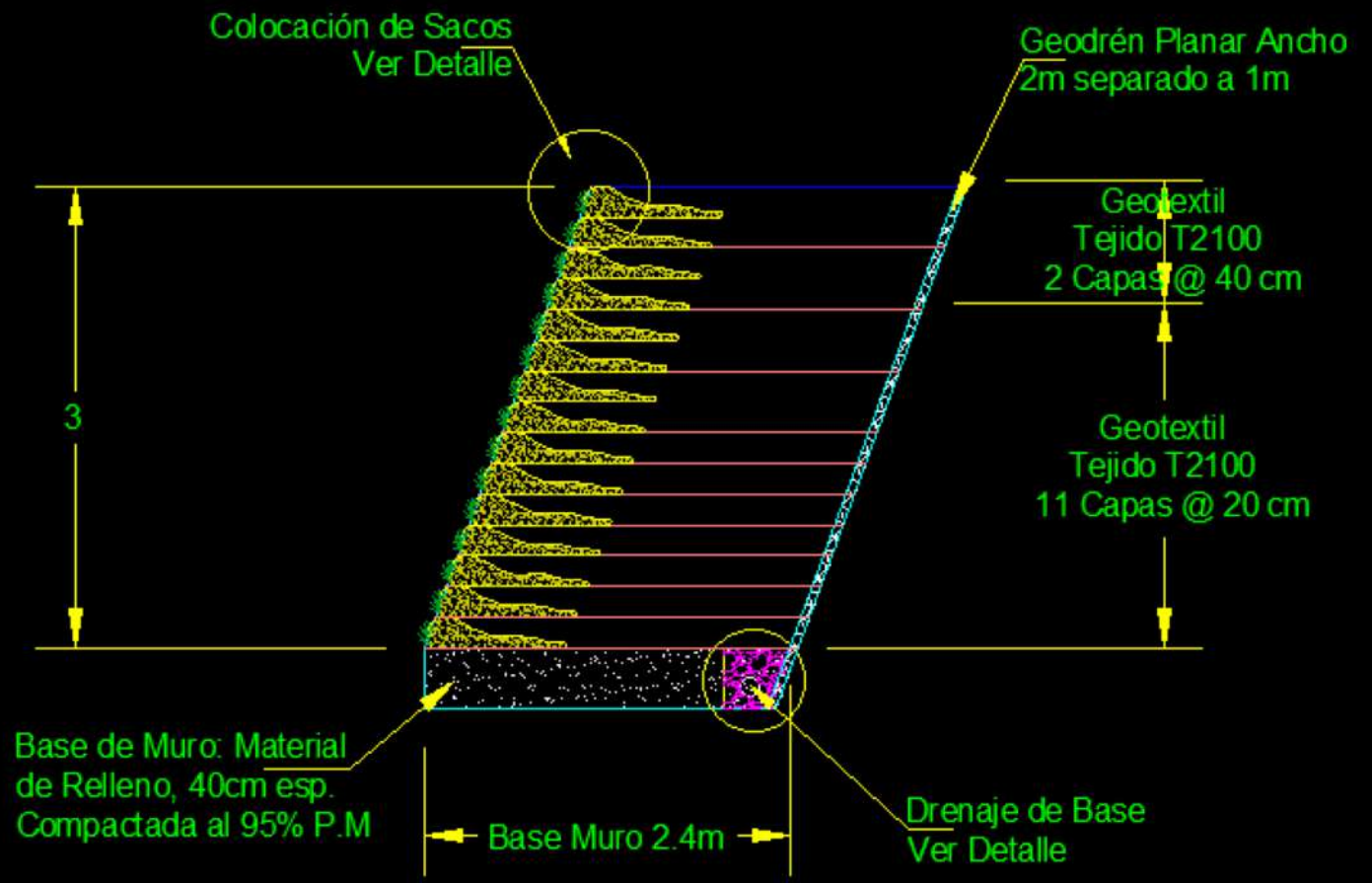

DETALLE DE COLOCACIÓN DE SACOS

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COSTA RICA

70%

MSR verdes

30%

MSR otros

Proyectos carreteros

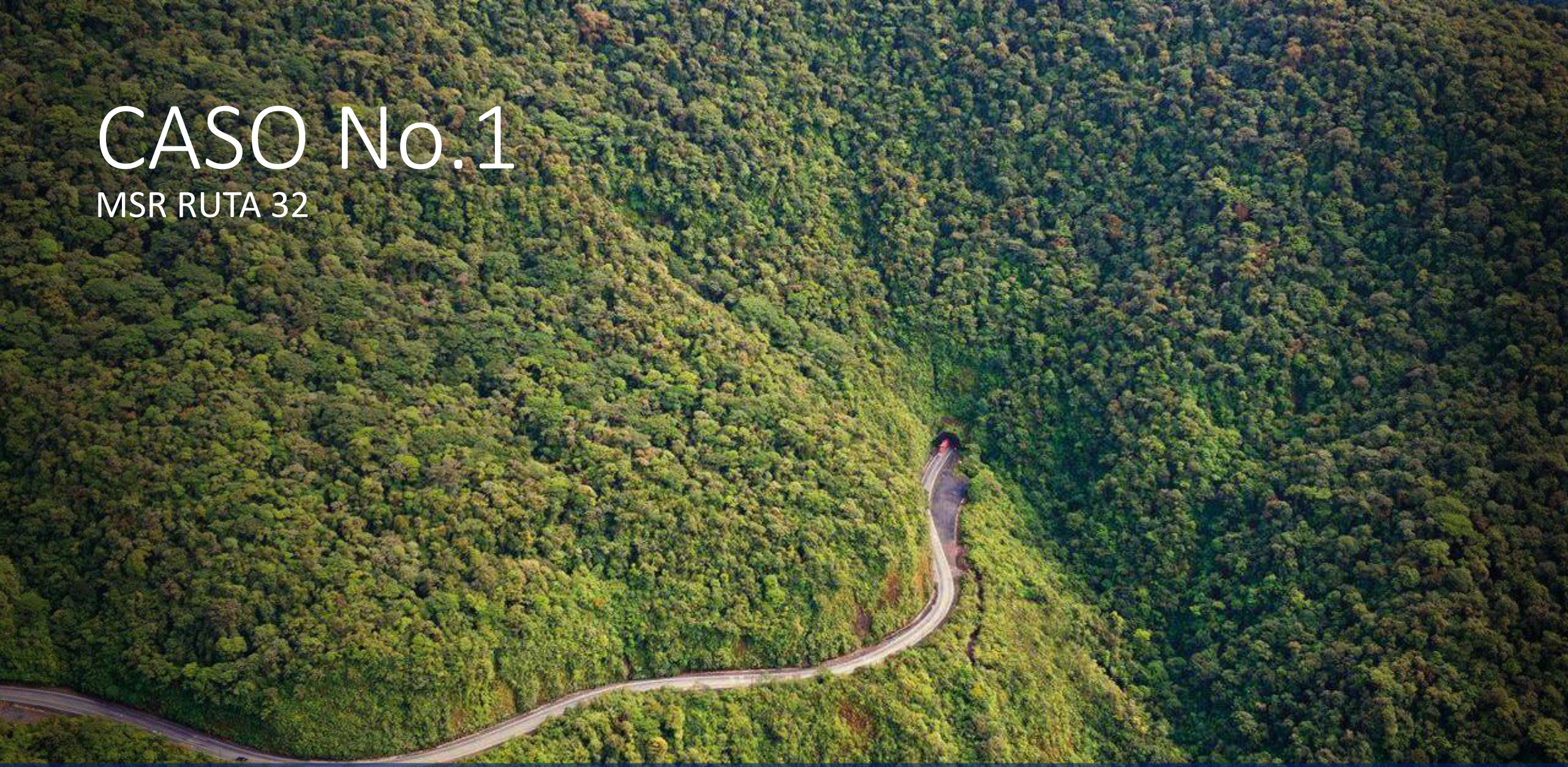
Desarrollos inmobiliarios

Desarrollos inmobiliarios costeros

Proyectos industriales

CASO No.1

MSR RUTA 32



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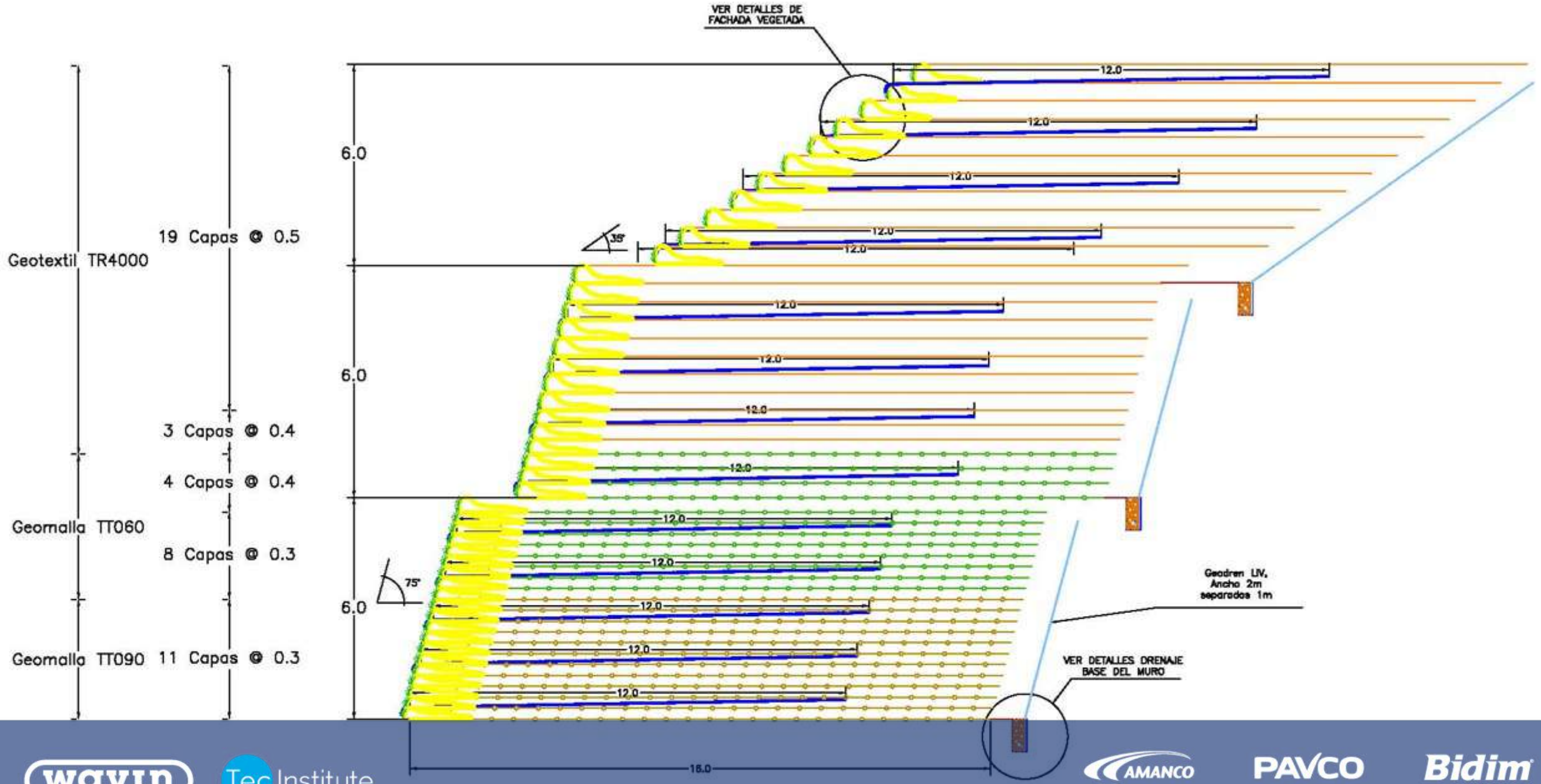

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CASO No.2

MSP RUTA 1

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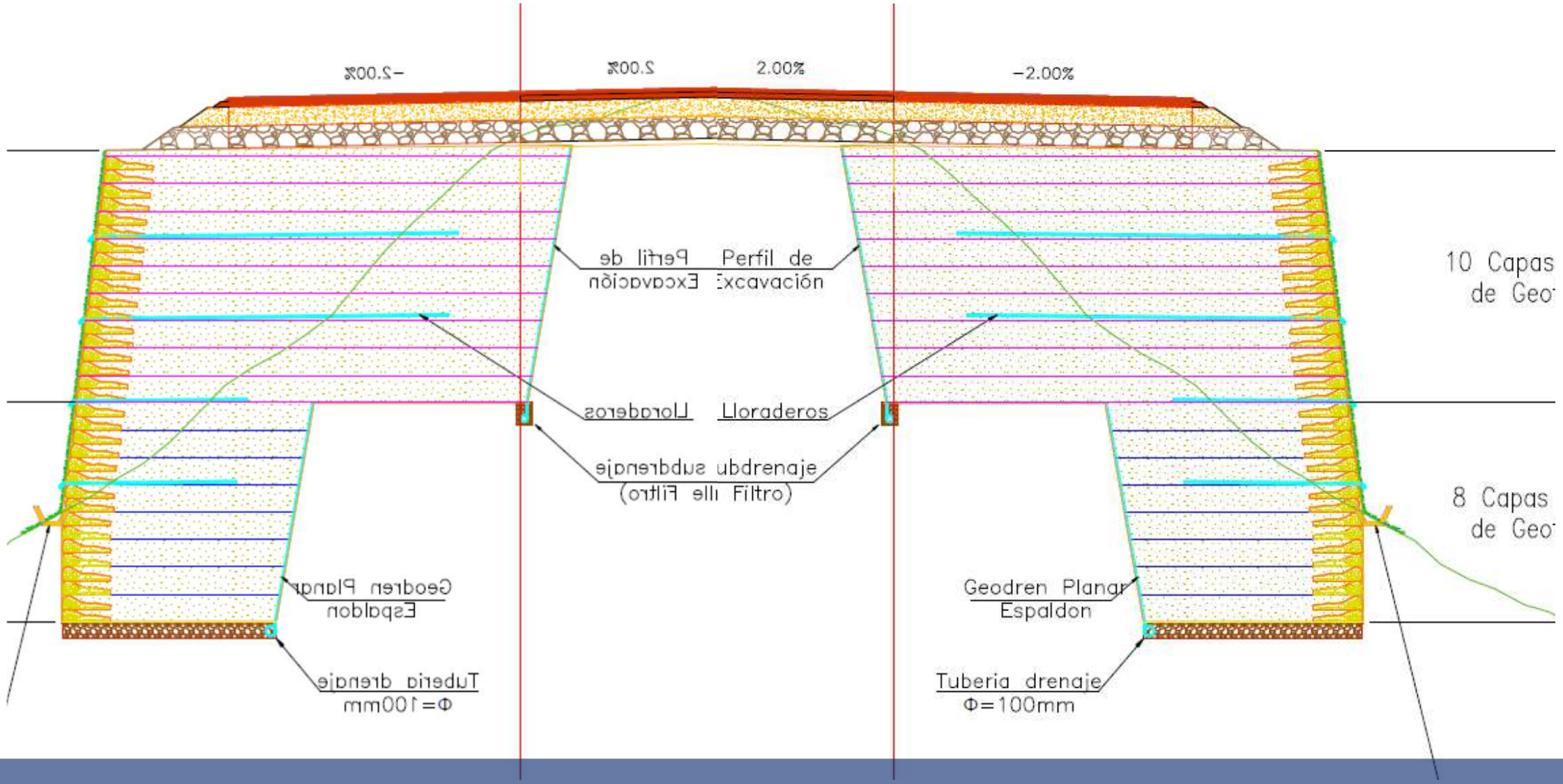
2.00%
−2.00%
Perfil de Excavación
Lloraderos
Geodren Planar Espaldon
Tuberia drenaje Φ=100mm
10 Capas de Geo
8 Capas de Geo

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Anexo 1
Caracterización de material
Subbase 3"
Fuente Quebrador Guacalillo
Muestra 1-19435-16

Tabla 1
Método de ensayo para el Límite líquido, límite plástico e índice de plasticidad en agregados y suelos
(*) "Ensayo Acreditado"
AASHTO T-89
AASHTO T-90

Parámetro	Resultado (%)
Límite líquido	NP
Índice plástico	NP

Tabla 2
Método de ensayo para el Índice de soporte California (CBR) de agregados y suelos compactados en laboratorio
(*) "Ensayo Acreditado"
AASHTO T-193

Parámetro	Resultado 95% de AASHTO T-99
CBR a 2,54 mm de penetración	65
CBR a 5,08 mm de penetración	75

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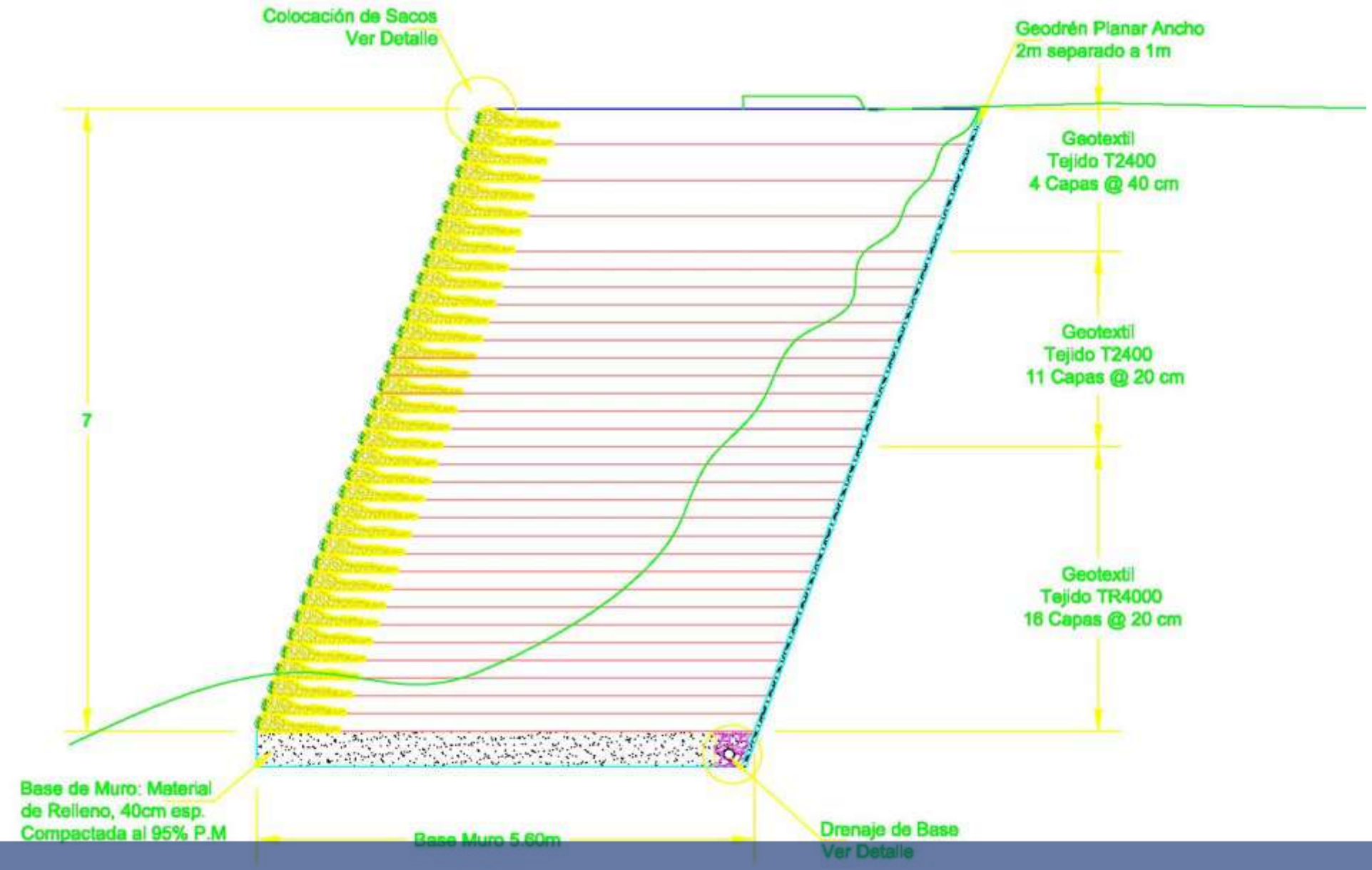

SECCION A-A

SIN ESCALA

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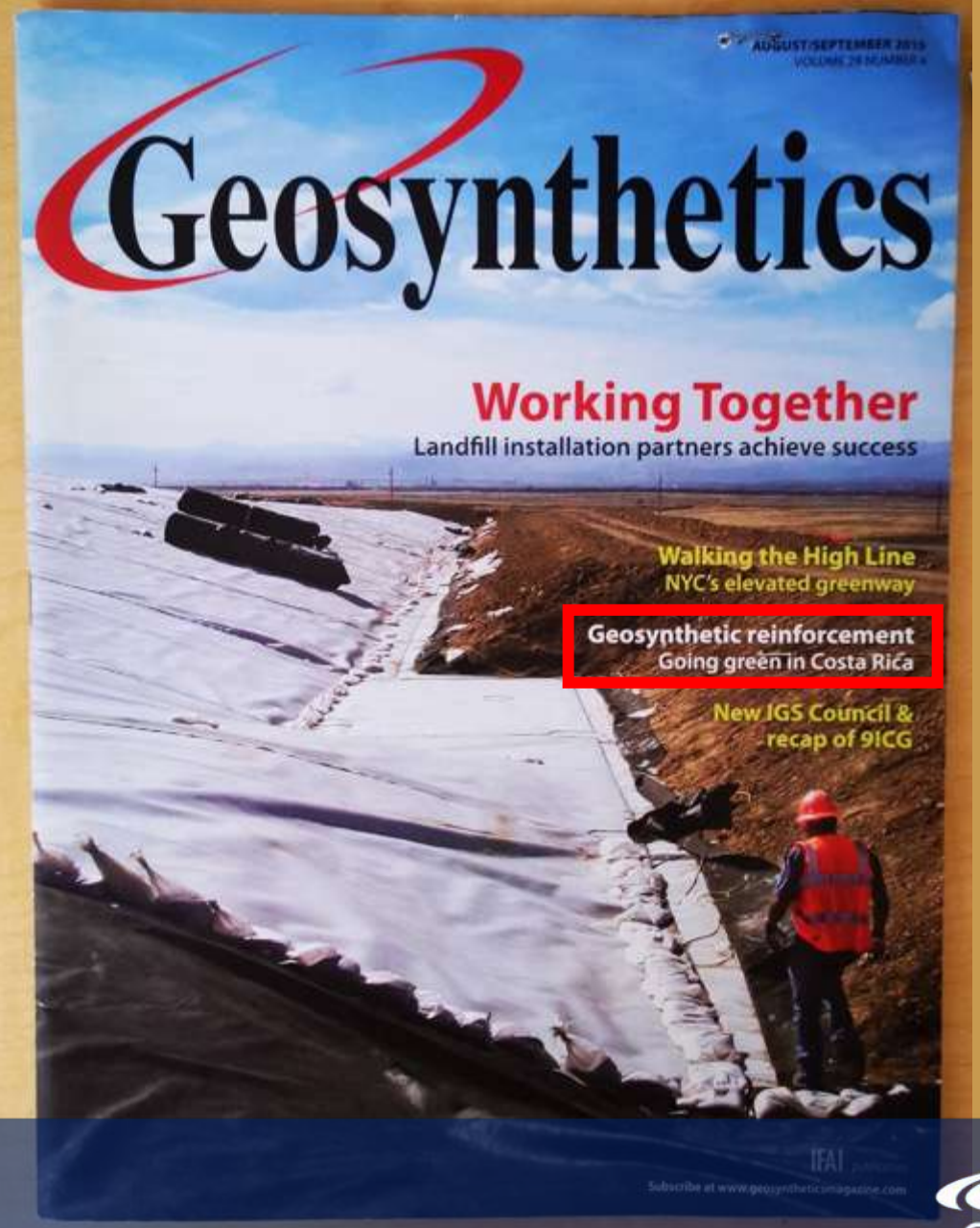

Vegetative state of the facade and new road two months after construction

An option for ecological and environmental projects

Green geosynthetic-reinforced soil walls

By Guerra Escobar and Roberto Madriz

For some projects, the environmental and landscaping requirements have obliged engineers and architects to look for novel methods of constructing retaining walls and slopes. Thus, the advent of "green" ons these structures.

In this project, they are constructed from soil reinforced with geosynthetics with facades made from UV-degradable sacks filled with organic material and vegetation to create a natural appearance. This article provides a detailed description of the designs of the green reinforced soil walls and slopes.

These designs incorporate the use of various geosynthetics, including woven geotextiles to reinforce the soil, geodrains for the drainage both behind and within the walls, and permanent turf reinforcement mats (TRMs) to protect the wall facade from erosion. Also presented are details of the construction process needed to ensure the stability of the wall.

This article concludes with an analysis of the green reinforced soil walls highlighting the economic, technical, and environmental advantages.

1. Introduction

Retaining soil walls and slopes reinforced with geosynthetic materials present an alternative to traditional retaining wall solutions, such as walls of reinforced concrete or soil embankments in their natural angle of repose.

Reinforced soil walls are challenging more traditional constructions due to their economic competitiveness and their green environmental credentials. Further, the introduction of soil walls or slopes has permitted the construction of retaining walls in places where the load capacity of the foundation soil is not sufficient for rigid walls or where there are space restrictions preventing the construction of soil fills or soil embankments at their natural angle of repose.

Geosynthetic-reinforced soil walls or slopes are also attractive solutions because of the flexibility they provide.

Guerra Escobar, M.P., AMANCO-PAVCO, Geosintéticos Pavco S.A., San José, Costa Rica

Roberto Madriz, AMANCO, technical advisor for geosynthetics

Ron Bygness, editor of Geosynthetics, also contributed to this article.

CASO No.4

Las Olas Dominical

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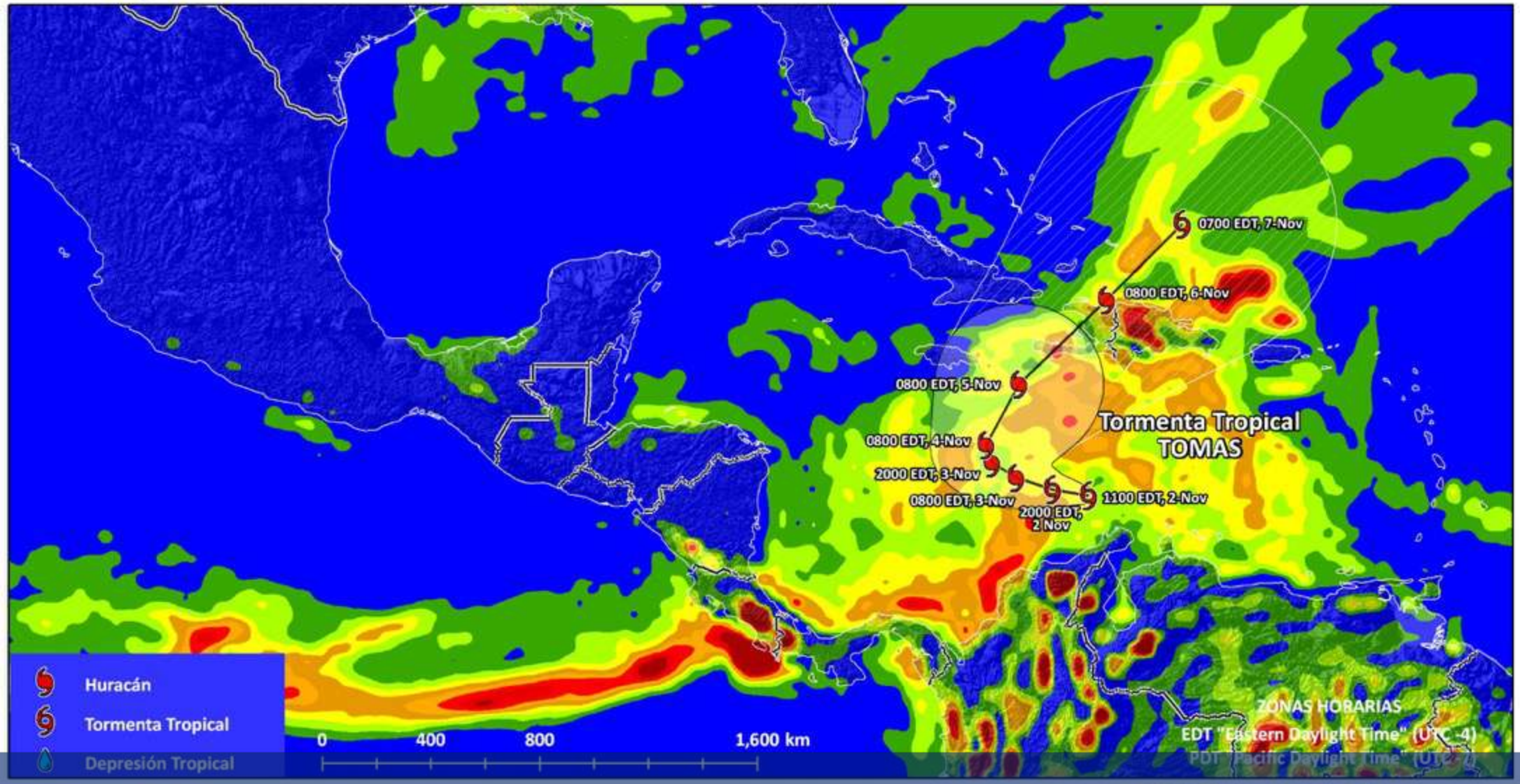
Pronóstico de precipitacion de 7 días en Mesoamérica y el Caribe para el periodo del 2 al 8 de noviembre de 2010

Generado por CATHALAC
2 Noviembre 2010, 1000 (UTC -5)



Fuentes de información: NOAA (GFS, NHC); ESRI, NASA

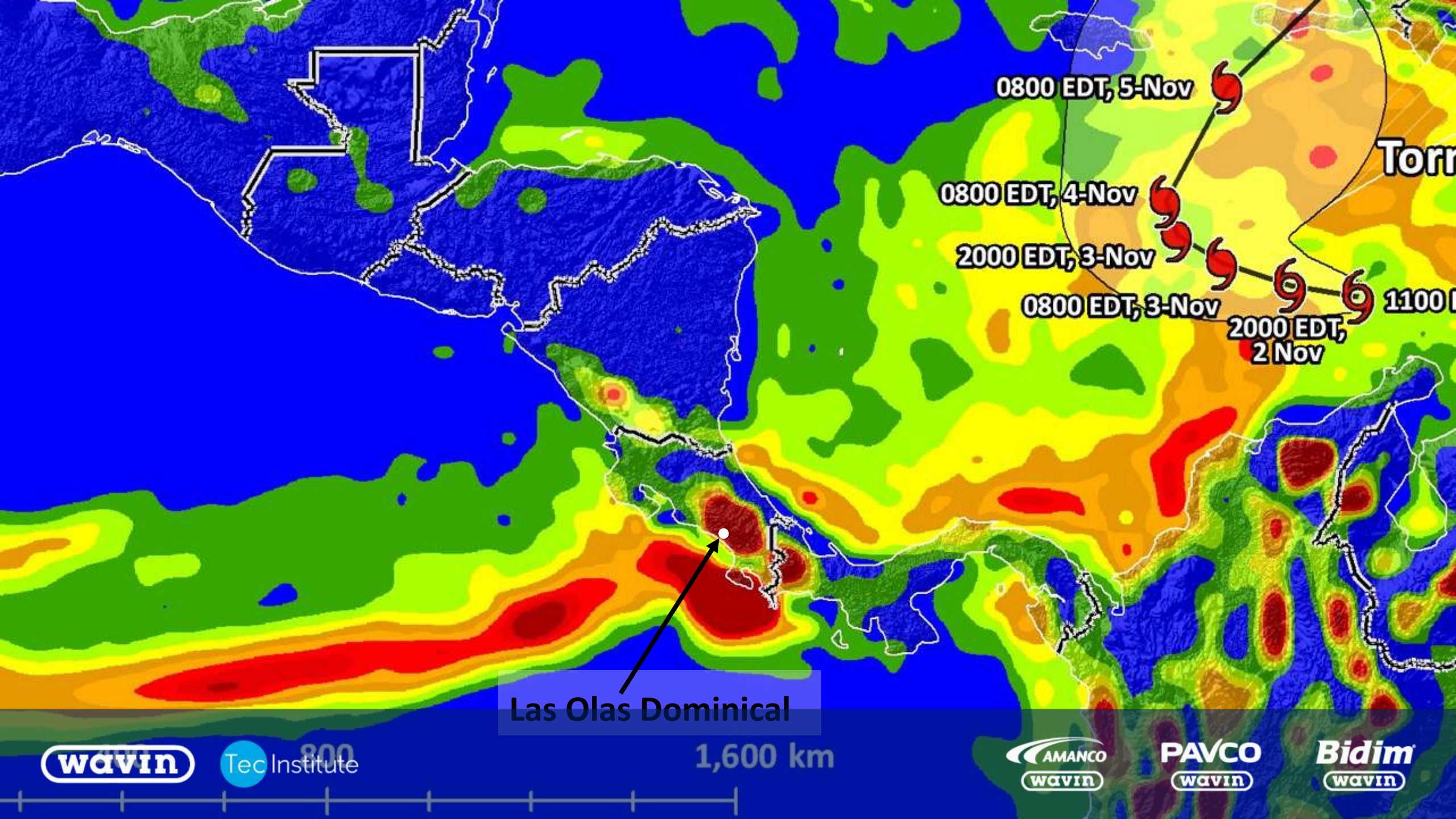
El peor temporal en años deja 21 muertos y graves daños en Costa Rica

- Hay al menos 1.400 evacuados por la tormenta tropical 'Thomas'
- La presidente, Laura Chinchilla, ha decretado al alerta nacional

05.11.2010 | 03:21 horas Por RTVE.es/ Efe

TIEMPO DE LECTURA 3 min.

El peor temporal de los últimos años en Costa Rica ha dejado hasta el momento 21 fallecidos, un número indeterminado de desaparecidos, 1.400 refugiados y graves daños materiales, mientras el Gobierno mantiene la alerta roja (máxima) para la vertiente del Pacífico y el centro del país.


0800 EDT, 5-Nov
0800 EDT, 4-Nov
2000 EDT, 3-Nov
0800 EDT, 3-Nov
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Las Olas Dominical
800
1,600 km

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PANAMÁ

NICARAGUA

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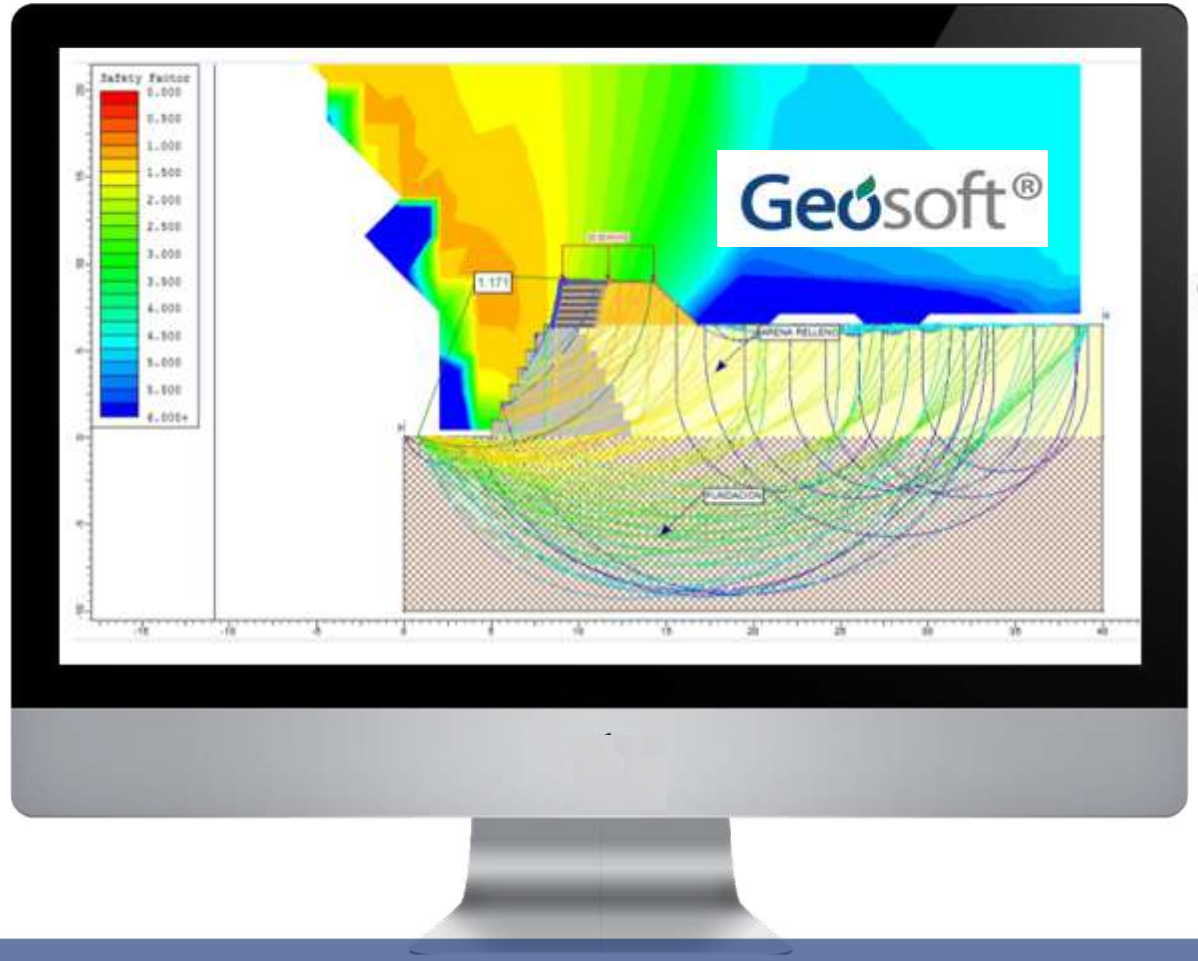
Reemplazar Métodos Tradicionales



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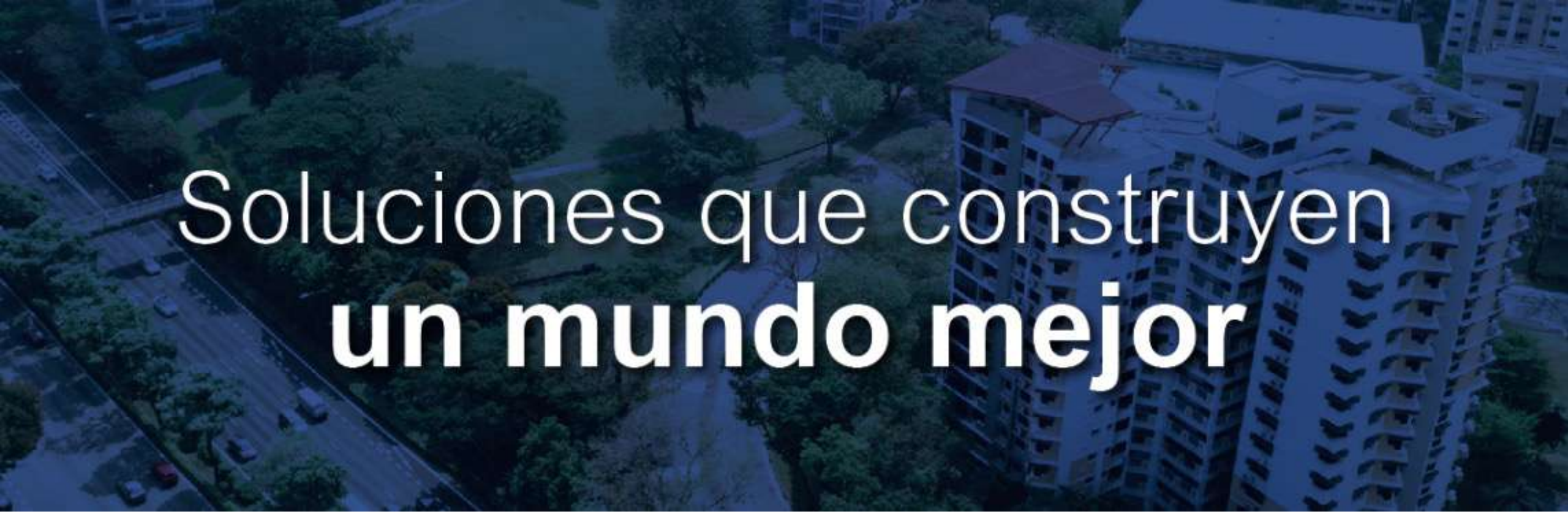

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