Arboricultural Subsidence Report



SUBSIDENCE INVESTIGATION AT:

Flat 1 and Flat 5
The Park
Tamworth Street
Duffield
Belper
DE56 4ER

Client:	Crawford and Company Adjusters UK
Reference No:	1891733
Enviro Trees UK Ref No:	TM4010
Report Date:	06/07/2026

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Introduction

Enviro Trees UK was instructed by Crawford and Company Adjusters UK to visit the insured property to:

- identify trees and shrubs within potential influencing distance of the area of damage at the insured property
- provide an opinion on the trees and shrubs being a causal factor in the damage to the insured property
- make recommendations on the immediate and future management of the trees and shrubs in relation to the damage at the insured property

The property was attended and assessed on 11/06/2026.

Shrinkable clay soil

Also known as shrink/swell clay, shrinkable clay soil shrinks as it dries and swells as it rehydrates. The top few metres of soil will tend to dry out in the summer months when the water demands of vegetation and evaporation exceed the replenishment by rainfall. During the winter months when trees have lost their leaves and/or become dormant, heavier rainfall exceeds the water demand of the vegetation and the soil moisture level increases again.

The composition and volume change potential of clay soils can be determined by laboratory analysis of soil samples.

Approximately 70% of all subsidence problems can be attributed to the behavior of clay soils. Structures built on clay soil will move up and down as the clay swells and shrinks through the seasons. Problems arise when different parts of a structure move at different rates leading to cracking of walls and foundations. This can be caused by a range of factors:

- Trees and other vegetation abstracting water leading to the drying and shrinking of the soil in one area more than another causing cracking. Approximately 60% of clay-related subsidence is exacerbated by the presence of trees and/or other vegetation.
- Leaking pipes can cause clay to swell and soften with a resultant drop in bearing capacity. The leak may also wash away the softened clay or smaller particles in non-cohesive soils leading to a loss of support for foundations.
- Different foundation depths: shallow foundations will be much more susceptible to seasonal volume changes of the clay whilst deep foundations may be founded below the level of seasonal influence. Different parts of a property built on different foundation depths may be subject to differential movement leading to cracking at the join.

This report concerns the first of these factors.

Almost half of all structural subsidence problems involve trees, and in a drought year this can increase to 70% of all claims. Size and leaf area are important factors in the water demand of vegetation so significant pruning will reduce the amount of water abstracted from the soil, but the effects are often short-lived. Trees and shrubs often respond to pruning with a prolific flush of growth that quickly replaces the lost leaf area. For this reason, removal of the influencing vegetation often offers a more reliable solution to rehydrate the moisture content of clay and stabilise the building. Where there are many trees and shrubs within potential influencing distance it may be appropriate to remove some and prune others. Follow-up monitoring will show whether the property has stabilised or whether further measures are required.

Environmental Impact Assessment (EIA)

The environmental impact assessment (EIA) process evaluates the potential biophysical, social and other effects of a subsidence request to avoid, mitigate or offset significant adverse effects. Its function is to identify problems, recommend solutions and promote and maximise the proposals' positive effects.

Trees are important assets in rural and urban landscapes. Their benefits include:

- Social: trees line our streets forming prominent features in parks and gardens that create aesthetically pleasing and peaceful environments. Trees are landscape features and strengthen landscape character and sense of place. Research has found positive links between trees and human wellbeing, with corresponding reductions in the rates of non-communicable diseases such as cancer.
- Environmental and ecological: trees contribute to improving air quality and their canopies provide shade and help regulate temperature. They support a wide range wildlife and are important source of food and habitat, supporting biodiversity and ecological networks.
- Economic: they provide timber, food and fuel.

Trees also have perceived negative attributes, including:

- damage to buildings and structures from root and canopy encroachment
- inconvenience of leaf litter and honey dew
- overshading and overbearing effects
- unwanted wildlife such as loafing birds and insects
- risk of harm to people and property.

Arboricultural inputs play an increasingly important role in informing the process, demonstrating that the interrelationship between trees and subsidence impact has been fully considered and a solution is sustainable. For instance, whilst trees absorb carbon dioxide, concrete underpinning may emit more CO_2 than could be absorbed by the trees if they were retained.

Enviro Trees UK considers the carbon absorption for the trees' life span relative to other remedial measures such as root barriers and underpinning in our recommendations.

Limitations

This report assumes that engineers are satisfied that the damage to the insured property is attributable to clay soil shrinkage resulting from moisture abstraction by vegetation.

The report may be subject to review upon receipt of additional site investigation data, monitoring, engineering or other information.

The trees were inspected from ground level. Trees and shrubs that are not recorded are considered to be beyond the range of influence and/or are not significant in the context of the current damage or expected to pose a threat in the foreseeable future. Our assessment was made externally (no entry into the building required).

The report does not include a detailed assessment of tree condition or safety. The health, condition and safety of trees should be checked on a regular basis – best practice recommends that trees are inspected every 18 months when they are alternately in and out of leaf and following extreme weather events. Third-party owners are advised to seek their own advice on tree health, structural integrity and risk. Conclusions and recommendations are valid for a period of one year and validity

may be reduced in the case of any change in conditions in proximity to the trees/shrubs or built structures.

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Property details

The property is a three-storey detached house. External walls are of natural stone masonry, with a pitched slate roof.

The site is generally level with no adverse topographical features noted.

Council area

Amber Valley Borough Council

Details of damage

Damage was observed to the bay window at right-hand flank wall.

Recorded information

The following details were recorded for each tree or shrub and tabulated in the schedule of findings:

- Species
- Height in metres
- The radius of the canopy spread in metres
- Trunk diameter measured 1.5m above ground level (diameter at breast height – DBH) and number of stems (# denotes estimated measurement where trunk is inaccessible)
- Estimated age and life stage based on trunk diameter and species
    - Young: establishing, usually with good vitality but as yet of limited significance in the landscape.
    - Semi-mature: established, normally vigorous, increasing in height and of increasing landscape significance.
    - Early-mature: established; approaching mature height with crown spreading.
    - Mature: fully established trees around the middle of their typical life expectancy; generally retaining good vitality and achieving full height but their crowns still spreading.
    - Over-mature: fully established trees toward the end of their typical life expectancy with declining vitality.
- Distance from property in metres *('#' denotes estimated distance*)
- Tree owner/location
- Vitality, previous works and comments
- Statutory protection (Tree Preservation Order or Conservation Area)

Data for subsidence risk

Arboricultural assessment considered the Crawford and Company Subsidence Site Note Pack.

Underlying geology

The BGS Geology Viewer suggests that the bedrock geology is likely to be Morridge Formation-Mudstone, siltstone and sandstone. These sedimentary rocks are fluvial, palustrine and shallow-marine in origin. They are detrital, forming deposits reflecting the channels, floodplains and deltas of a river in a coastal setting (with periodic inundation from the sea).

Superficial deposits are Alluvium-Clay, silt, sand and gravel. These sedimentary deposits are fluvial in origin. They are detrital, ranging from coarse- to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river or estuary (if in a coastal setting).

Site Investigations

Site investigations involve digging trial pits to determine foundation depths, soil type and plasticity (shrinkability), and to identify any roots found below the foundations. They can also investigate other possible influences such as the integrity of drains. The information they provide can be useful in determining the cause of structural movement.

Site investigations were carried out by Fastrack on 24/03/2026 when trial pits were excavated to reveal the foundations and to determine subsoil conditions. The results are summarised in the plan and tables below.

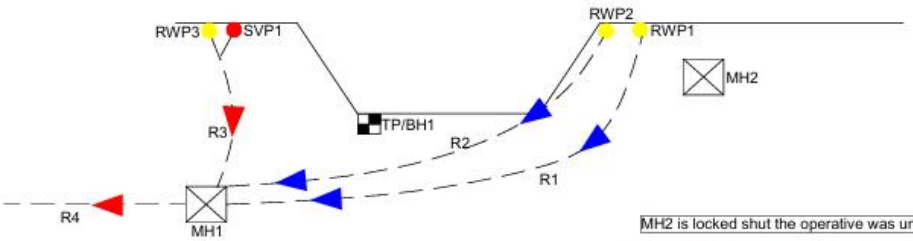
Site investigation plan showing location of boreholes

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Appendix No: 1
FSI Ref: 30609

SITE PLAN

Property Address: The Park, Flat 1 and Flat 5, Tamworth Street, Duffield, Belper, Derbyshire, DE56 4ER
Client Claim Ref: 1891733 **Survey date:** 24/03/2026 **Operative:** CE2



MH2 is locked shut the operative was unable to open.



Scale:	Drawn by:	Key:
NTS	BW	Trial Pit, Borehole, Manholes, Rain Water Pipe, Soil & Vent Pipe, Surface Water Gully, Foul Water Gully, Shrub, Tree (Conifer), Tree (Deciduous)

Drilling Report

Date	24/03/2026
Service Provider	Fastrack
Number of Trial pits (TP)	1
Number of Bore Holes (BH)	1

Foundations

TP/BH Number	Type	Depth at Underside (mm)
TP1	Concrete	820

Roots

TP/BH Number	Roots observed to depth (mm)	Identification	Root Dia. (mm)	Starch
TP/BH1	820	probably a twig	3	Absent
	820	broadleaved species, too decayed for positive identification	1.5	Absent
	820	Pomoideae gp.	1	Abundant
	2000	either Quercus spp. or Castanea spp.	1	Absent
	2500	Pomoideae gp.	1	Absent
	2500	probably Quercus spp. or Castanea spp.	<1	Absent

Soils

TP/BH Number	Description	Plasticity Index %	Volume Change Potential (NHBC)
BH1	Brown silty, sandy CLAY containing grey and orange mottle, and sub-rounded gravel	19-28	Low-Medium
	Brown silty, sandy CLAY containing orange mottle and sub-rounded gravel		
	Brown / orange silty, sandy CLAY containing sub-rounded gravel		
	Brown silty, sandy CLAY containing orange mottle		

Drains

The survey of the below ground drainage system revealed the following:

- Run 1 - From MH1 Upstream to RWP1 - Structurally sound with no leakage evident.
- Run 2 - From MH1 Upstream to RWP2 – Structurally sound with no leakage evident.
- Run 3 - From MH1 Upstream to RWP3 – Structurally sound with no leakage evident.
- Run 4 - From MH1 Downstream – Structurally sound with no leakage evident.

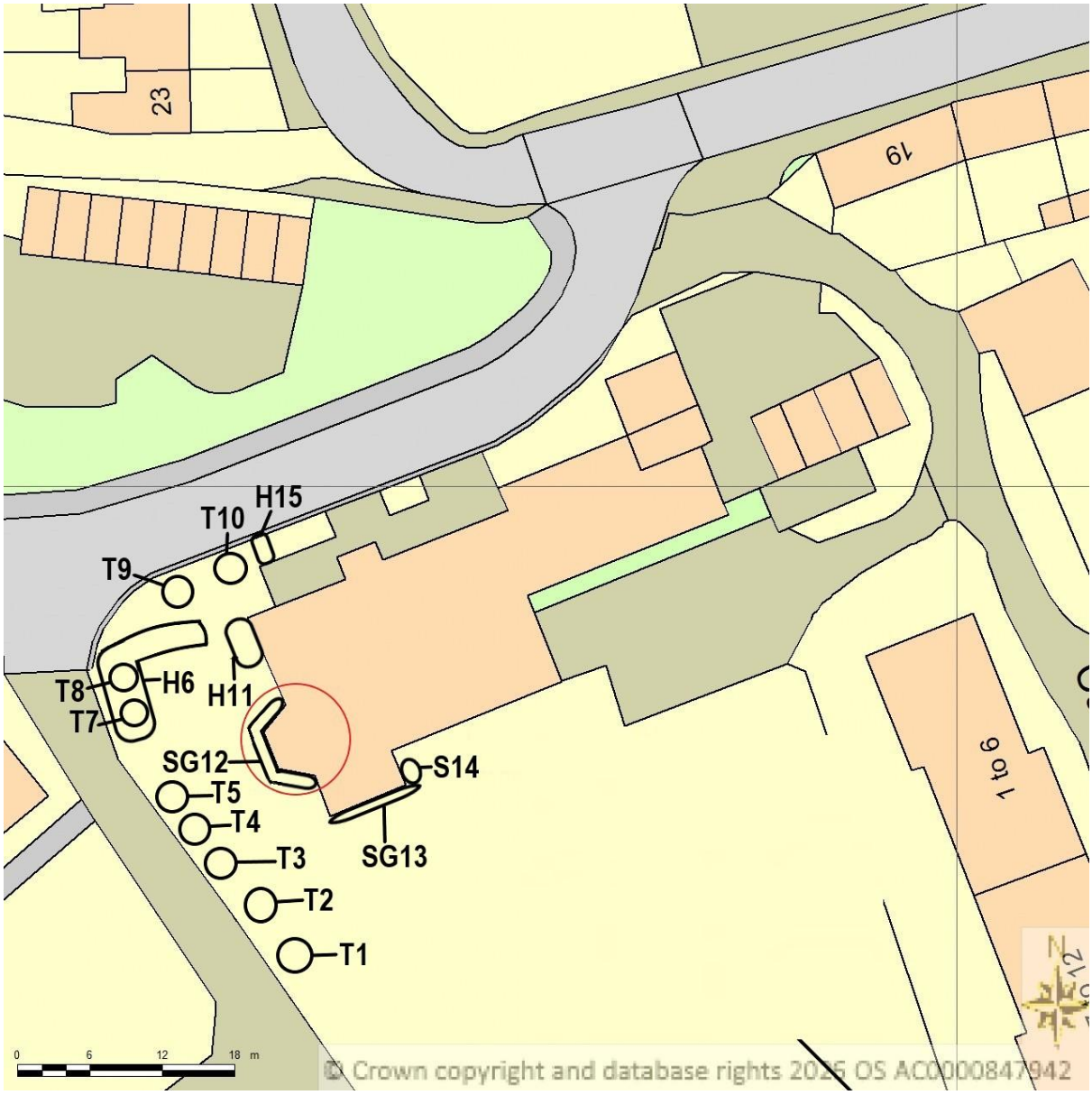
Schedule of findings

Ref.	Species	Height (m)	Canopy radius (m)	DBH (cm) No. of stems	Estimated age and Life stage	Distance to area of damage (m)	Tree owner/ location	Vitality, previous works, comments	TPO/ CA
T1	Lime	15	5	35 # 1	35-55 Early-mature	23 #	Insured	Good. No recent management.	CA
T2	Lime	18	6	50 # 1	50-75 Early-mature	20 #	Insured	Good. No recent management.	CA
T3	Lime	16	4	40 # 1	40-60 Early-mature	20 #	Insured	Good. No recent management.	CA
T4	Oak	14	5	45 # 1	80-110 Early-mature	13 #	Insured	Good. No recent management. High-water demand.	CA
T5	Cherry Plum	7	3	30 # 1	50-75 Mature	10 #	Insured	Good. Regular pruning.	CA
H6	Yew, Laurel	2				6 #	Insured	Good. Regular pruning.	CA
T7	Oak	16	6	60 # 1	100-150 Early-mature	8 #	Insured	Good. No recent management. High-water demand.	CA
T8	Crabapple	4	5	30 # 1	40-55 Mature	9 #	Insured	Good. No recent management.	CA
T9	Lime	13	3	40 # 1	40-60 Early-mature	13 #	Insured	Good. No recent management.	CA

Ref.	Species	Height (m)	Canopy radius (m)	DBH (cm) No. of stems	Estimated age and Life stage	Distance to area of damage (m)	Tree owner/ location	Vitality, previous works, comments	TPO/ CA
T10	Lawson Cypress	14	4	40 # 3	70-100 Early-mature	13 #	Insured	Good. No recent management. High-water demand.	CA
H11	Laurel	3				3 #	Insured	Good. Regular pruning.	CA
SG12	Mixed shrubs, Laurel,	1				1 #	Insured	Good. No recent management.	CA
SG13	Mixed shrubs	1				2 #	Insured	Good. No recent management.	CA
S14	Wisteria	3				10 #	Insured	Good. Regular pruning.	CA
H15	Yew	1				8 #	Insured	Good. Regular pruning.	CA

 # denotes that the distance was estimated

Tree plan



Tree plan showing area of damage with red circle and location of neighbours as detailed below.

Reference	Address
Council	Amber Valley Borough Council

Analysis

- Lime (T1) is unlikely to be of influence.
- Lime (T2) is toward the maximum distance for damage in the C&R study.
- Lime (T3) is toward the maximum distance for damage in the C&R study.
- Oak (T4) has a high-water demand and is within the maximum distance for damage in the C&R study. Laboratory analysis of the roots found below foundation depth during the site investigation identified them as Quercus spp.
- Cherry Plum (T5) is toward the maximum distance for damage in the C&R study.
- Yew, Laurel (H6) is unlikely to be of influence.
- Oak (T7) has a high-water demand and is within the 50% distance for damage in the C&R study. Laboratory analysis of the roots found below foundation depth during the site investigation identified them as Quercus spp.
- Crabapple (T8) is toward the maximum distance for damage in the C&R study.
- Lime (T9) is toward the maximum distance for damage in the C&R study.
- Lawson Cypress (T10) has a high-water demand and is within the maximum distance for damage in the C&R study.
- Laurel (H11) is within the 75% distance for damage in the C&R study.
- Mixed shrubs, Laurel, (SG12) is within 50% of the radius of influence defined by NHBC.
- Mixed shrubs (SG13) is toward the outer limit of the zone of influence defined by NHBC.
- Wisteria (S14) is unlikely to be of influence.
- Yew (H15) is unlikely to be of influence.
- At time of writing, no level monitoring reports were available to confirm seasonal movement therefore any recommendations to mitigate current or future risk are based on the limited data available.

Note: the radius of the zone of influence is taken from "*Tree Roots & Buildings*" Cutler, D.F. and I.B.K. Richardson, (1989) or determined in accordance with NHBC Standards Chapter 4 2021.

Conclusions

- Reference to the British Geological Society Geological Viewer indicates that the underlying soils are likely to include shrinkable clay.
- The site investigations have shown the presence of shrinkable clay soil.
- This survey has identified woody vegetation within influencing distance of the property.
- The site investigations have found roots below the foundations which have been matched to the vegetation identified in the schedule of trees and shrubs in this report.
- Engineers are satisfied that the damage to the insured property is attributable to clay soil shrinkage resulting from moisture abstraction by vegetation.

Recommendations - Current claim

These recommendations are made based on the information available and may be revised on receipt of additional information.

Consideration has been given for pruning alone as a means of mitigating the vegetation impact. However, in this case this is not considered a viable long-term solution.

Ref.	Species & estimated age	Height DBH (m)	Dist. to area of damage (m)	Vitality & previous works	Tree owner/ location	Recommendation	TPO CA
T4	Oak 80-110 Early-mature	14 (0.45)	13 #	Good	Insured	Remove close to ground level and treat stump with ecoplugs or suitable alternative to inhibit regrowth.	CA
T7	Oak 100-150 Early-mature	16 (0.60)	8 #	Good	Insured	Remove close to ground level and treat stump with ecoplugs or suitable alternative to inhibit regrowth.	CA
H11	Laurel	3	3 #	Good Regular pruning	Insured	Remove stems within 5 metres of area of damage and maintain remainder at no greater than current size through regular pruning.	CA
SG12	Mixed shrubs, Laurel,	1	1 #	Good	Insured	Remove close to ground level and treat stump with ecoplugs or suitable alternative to inhibit regrowth.	CA

 # denotes distance was estimated

Recommendations - Future risk

The following recommendations are made to reduce the risk of a recurrence of the damage in the current claim.

Ref.	Species & estimated age	Height DBH (m)	Dist. to area of damage (m)	Vitality & previous works	Tree owner/ location	Recommendation	TPO CA
T5	Cherry Plum 50-75 Mature	7 (0.30)	10 #	Good Regular pruning	Insured	Maintain at no greater than current size through regular pruning.	CA
T8	Crabapple 40-55 Mature	4 (0.30)	9 #	Good	Insured	Maintain at no greater than current size through periodic pruning.	CA
T9	Lime 40-60 Early-mature	13 (0.40)	13 #	Good	Insured	Maintain at no greater than current size through periodic pruning.	CA

Ref.	Species & estimated age	Height DBH (m)	Dist. to area of damage (m)	Vitality & previous works	Tree owner/ location	Recommendation	TPO CA
T10	Lawson Cypress 70-100 Early-mature	14 (0.40)	13 #	Good	Insured	Maintain at no greater than current size through periodic pruning.	CA
SG13	Mixed shrubs	1	2 #	Good	Insured	Maintain at no greater than current size through periodic pruning.	CA

 # denotes distance was estimated

Statutory protection

The presence of Tree Preservation Orders (TPO) or Conservation Area status should be confirmed prior to any tree works being implemented. Failure to do so can result in fines in excess of £20,000.

Trees and wildlife

Trees are hosts to nesting birds and mammals. Under the Wildlife and Countryside Act it is an offence to disturb any nesting bird or bat. Before carrying out any works it is important to ensure that there are no birds or bats in residence.

Tree Ownership

In cases where ownership is noted as "unclear", investigations have already been undertaken to establish ownership, including title boundary and satellite mapping analysis, Land Registry checks, and engagement with relevant stakeholders where possible. Where absolute certainty of ownership is necessary, appointment of a topographical surveyor is recommended to provide formal confirmation.

Implementation of Tree Works

Tree removal offers the best long-term outcome, helping the ground to recover, and allowing property repairs to commence sooner and be completed without future disruption.

Tree pruning is considered a less effective tree management solution; however, it may be the preferred option of the Local Authority tree owner(s). While insurers may initially accept this approach as a form of mitigation, such acceptance would typically be on a '*without prejudice'* basis. Any pruning should take into consideration the findings of BRE guidance IP 7/06 'Pruning Trees to Reduce Water Use'

Tree work is skilled and potentially dangerous. Work should be carried out by trained and certificated contractors working to BS 3998: 2010 *Recommendations for Tree work.*

Stump Height and Ground-Level Removal

Where tree removal is specified as "*cut close to ground level*", this refers to reducing the stump to approximately 50 - 100 mm (5 - 10 cm) above the surrounding ground surface, provided that site conditions allow.

In some circumstances, it may not be practical or safe to achieve this height — for example, where the tree is located on a slope, where access for cutting equipment is restricted, or where the stump

contains embedded debris such as metal, stone, or concrete. In such cases, the stump may be left slightly higher to avoid equipment damage or safety risks.

Herbicide Application and Stump Management

Where herbicide treatment has been recommended or applied, it should be understood that herbicide acts as a growth inhibitor rather than a guaranteed means of killing a stump. While it can significantly reduce the likelihood of regrowth, complete dieback cannot be assured due to variations in species resilience, stump size, timing of application, and environmental conditions.

It remains the responsibility of the property owner or manager to monitor and manage the treated stumps following the initial application. This may include reapplying a form of commercially available herbicide where signs of regrowth appear, or arranging for further mechanical treatment (such as stump grinding or excavation) if regrowth persists.

Regularly removing any suckers or shoots that emerge from the stump or roots can also help suppress regrowth by depleting the remaining root system's stored energy. Consistent management over time is usually necessary to ensure the stump becomes inactive.

Enviro Trees cannot guarantee that herbicide treatment alone will permanently prevent regrowth, and subsequent management remains the ongoing responsibility of the property owner or manager.

Replacement Planting

Replacement planting may be possible but would require careful choice of species and position to avoid a recurrence of the current claim.

Photographs



T1



T1



T2



T2



T3



T3



T4



T4



T5



T5



H6



H6



T7



T7



T8



T8



T9



T9



T10



T10



H11



H11



SG12



SG12



SG13



SG13



S14



S14



H15



H15

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