September 9, 2024

Further Measures to Preserve Trees and New Measures to Create Greenery in the Jingu Gaien District Urban Redevelopment Project
(Supplementary Materials)

This document provides supplementary materials to the following release dated on the same day.

Further Measures to Preserve Trees and New Measures to Create Greenery in the Jingu Gaien District Urban Redevelopment Project

URL：https://www.jingugaienmachidukuri.jp/pdf/en-jingugaienmachidukuri_news_2024090901.pdf

1. Increase in the number of trees after redevelopment

(1) Reduction in the number of trees to be removed due to facility design adaptions, etc

(i) New rugby facility site

The number of trees to be removed in the new rugby facility site will decrease by 27 (including 6 dead or ailing trees[*1]).

a. Facility design adaptions

By setting back part of the northern section of the new rugby facility, 9 trees for removal at the Kenkoku Kinen Bunko site will be preserved (Figure 1).

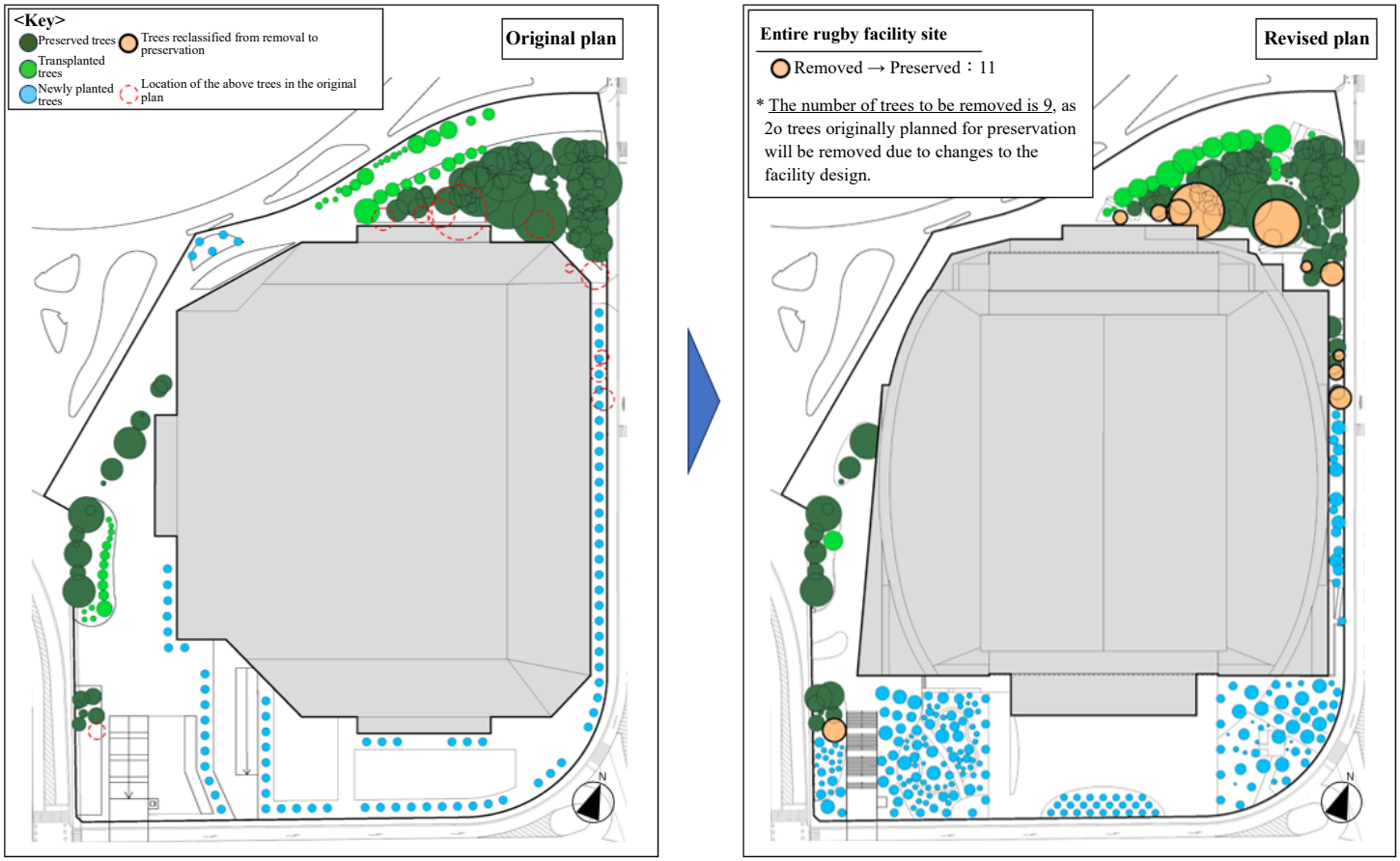
b. Revisions etc. based on the 2023 tree research

Based on the results of the 2023 tree research, 12 trees for removal will be transplanted, including trees judged to be recovering as the project progresses and trees judged to be viable for transplant due to sufficient preparation.

*1 “Dead or ailing trees” refers to withered or decaying trees that need to be removed for safety management reasons.

To improve the growing environment for trees around the new rugby facility, the height of the building will be reduced from approximately 55.0 meters in the original plan to around 48.0 meters.

Figure 1 New rugby facility site - Location of reclassified trees and facility design changes



*2 Existing trees shown in the figure for the original plan are based on data from the 2019 tree research, while existing trees shown in the figure for the revised plan are based on data from the 2023 tree research; tree canopy (shown by size of circle) may differ between the figures due to tree growth, etc.

*3 Preserved trees shown in the figure for the revised plan include trees that have been reclassified from transplant to preservation due to the facility design adaptions.

*4 Only trees 3.0 meters or taller are shown.

*5 Specific details on the location of transplanted and newly planted trees are yet to be determined and may be subject to change.

(ii) Project plan for the area in front of the Meiji Memorial Picture Gallery (hereinafter, “the area in front of the picture gallery”)

The number of trees to be removed from the area in front of the picture gallery will decrease by 79 (including 18 dead or ailing trees).

a. Facility design adaptions, etc.

Due to changes to the layout and a reduction in the scale of buildings and other structures, 55 trees for removal from the road around the gallery will be preserved (Figure 2).。

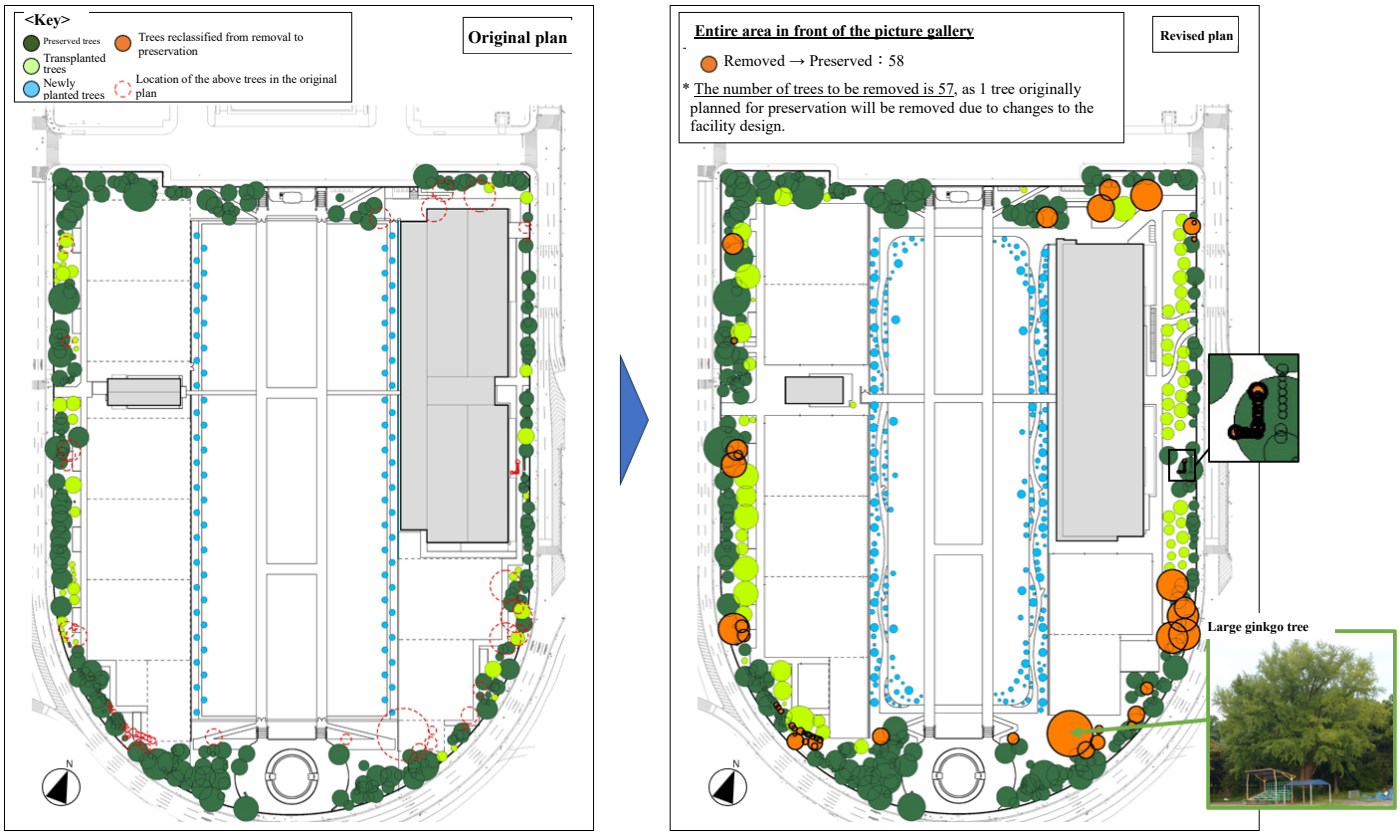
b. Design changes to the Maruike area

Due to design changes to the Maruike area, 2 trees for removal will be preserved (Figure 2).

c. Revisions based on the 2023 tree research

Based on the results of the 2023 tree research, 4 trees for removal will be transplanted, as they are judged to be recovering.

Figure 2 Area in front of the picture gallery - Location of reclassified trees and facility design changes



*6 Existing trees shown in the figure for the original plan are based on data from the 2019 tree research, while existing trees shown in the figure for the revised plan are based on data from the 2023 tree research; tree canopy (shown by size of circle) may differ between the figures due to tree growth, etc.

*7 Preserved trees shown in the figure for the revised plan include trees that have been reclassified from transplant to preservation due to the facility design adaptions.

*8 Only trees 3.0 meters or taller are shown.

*9 Specific details on the location of transplanted and newly planted trees are yet to be determined and may be subject to change.。

(iii) Reasons for tree removal

Under the project, each and every tree will be handled with care, and the layout and distribution of buildings will be considered to preserve as many trees as possible. Trees that are judged to be difficult to preserve in their current state will be transplanted.

However, trees that are not deemed to be viable for transplantation and trees that are not expected to be able to maintain healthy tree growth and shape after replantation because of unavoidable reasons such as “designation as a priority control invasive alien species[*10],” “proximity to existing facilities preventing necessary preparation for transplantation,” or “weak tree vitality,” will be removed and reutilized, including within the Gaien land where possible.

*10 Priority control invasive alien species: Species such as the Glossy Privet (ligustrum lucidum), which is designated as a “priority control invasive alien species” in the “List of Invasive Alien Species That May Cause Damage to the Ecosystem in Japan (List of Invasive Alien Species for the Prevention of Ecosystem Damage)” prepared by the Ministry of the Environment and the Ministry of Agriculture, Forestry and Fisheries in 2015.

Of the 619 trees to be removed, 474 trees will be removed from the Scenic District for the following reasons.

Table 1: Reasons for removal of trees in the Scenic District

Reasons for removal	No. of trees
(i) Priority control invasive alien species	28
(ii) Close proximity to existing facilities	270
(iii) Weak tree vitality	164
(iv) Soil contamination	2
(v) Other*11	10
Total	474

*11 The 2023 tree research determined that these trees can be transplanted due to a recovery in vitality or the progress of the project, but they are outside the scope of the redesigned new rugby facility site and the area in front of the picture gallery, so they remain classified as trees to be removed, in line with the original plan based on the 2019 tree research. As the facility designs progress, the classification of these trees will be updated to reflect the latest research results.

Figure 3: Examples of trees not deemed to be transplantable

Examples of trees in close proximity to existing facilities (to be removed as preparation for transplantation cannot be carried out)

Baseball field first base side, Y02-172 trident maple

Example of a tree with weak vitality

Baseball field first base side, Y02-086 Japanese stone oak

Examples of trees in close proximity to existing facilities
(to be removed as preparation for transplantation cannot be carried out)

Row of trees next to the indoor tennis court

Row of trees next to the indoor ballgame facility

(2) Increase in the number of newly planted trees

(i) New rugby facility

Regarding the greening plan for the new rugby facility site, (1) new trees to be planted on the east side of the site will be planted in counterpoint to the existing trees in the plaza in front of the picture gallery, giving further consideration to continuity along the green walkway that runs north-south through the Jingu Gaien District. (2) In addition, under the plan for the south side of the site, a new, more lively open space for resting and walking with a large volume of medium-height shrubbery and a light thicket of trees will be created, improving integration with the Jingu Gaien District Central Plaza and new woodland areas.

As a result, the number of new trees to be planted will increase from 81 under the original plan to 212, an increase of 131 trees, resulting in a green environment with more trees than on the current site.

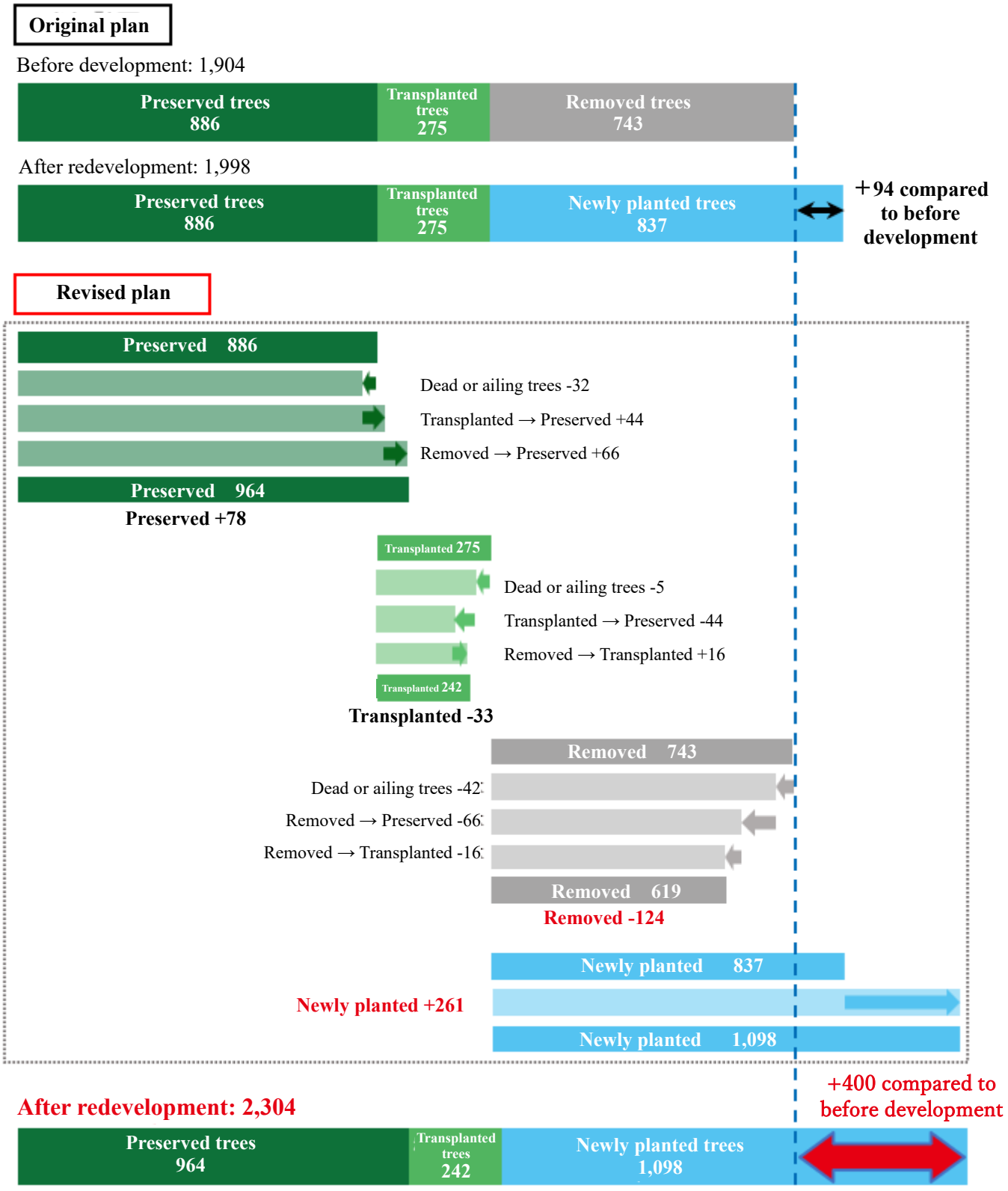
(ii) Area in front of the picture gallery

Regarding the greening plan for the area in front of the picture gallery, the distribution of new trees has been revised based on an approach of naturally distributing trees of various species and heights, referencing how the plaza looked when it was built. As a result, the number of newly planted trees will increase from 398 under the original plan to 528, an increase of 130 trees.

As a result of the above, changes in the number of trees from the original plan are as follows.

(The increase of 400 trees is the total of: a reduction in the number of trees to be removed (124); an increase in the number of trees to be planted (261); an increase in new trees to be planted under the original plan (94); minus dead or ailing trees (79))

Figure 4: Comparison of number of trees between original plan and revised plan



*12 The number of trees described in this release and the Supplementary Materials only covers trees 3.0 meters or taller.

*13 Transplanted trees include 19 trees under consideration for transplantation.

2. Wider setback for the new baseball stadium

(1) Results of root system research

The objective of the root system research is to confirm the positioning of the roots and their growth condition (circumference, number of roots, etc.) with respect to the westernmost row of the Four Rows of Ginkgo Trees upon assessing effects that construction of the new baseball stadium situated adjacent to the trees would have. The first root system research surveyed the circumference and the number of roots. The second root system research then added to this by confirming the length of some of the roots.

The environmental impact assessment report has set the distance from the sidewalk curb on the west side of the rows of ginkgo trees to the underground framework of the new baseball stadium (hereinafter, “the setback width”) as 8.0 meters. It also sets following criteria for determining how to deal with roots: “If root system research results in fewer than four large roots (diameter of at least 30 millimeters) in the surveyed section (1.0 meter x 1.0 meter), the roots may be cut, and if the research finds four or more roots, girdling shall be carried out on the roots. In cases where a tree doctor has judged that there are multiple roots that have an influence on the growth of a tree, then efforts will be made to preserve said tree, including adjustments to facility design, based on the opinion of the tree doctor.” (Figure 5)

Figure 5: Survey cross section criteria in root system research

■ Root distribution checked within each 10 centimeter mesh square of the survey cross section (1.0 meter x 1.0 meter)
■ The criteria for making judgements in the environmental impact assessment report are as follows.
・Fewer than four roots with a diameter of at least 30 millimeters: Roots will be sharply cut off
・Four or more roots with a diameter of at least 30 millimeters: Roots will be girdled
・If a tree doctor judges that there are multiple roots that have an influence on the healthy growth of the tree: Efforts will be made to preserve said tree, including adjustments to facility design, based on the opinion of the tree doctor.

For an overview of the research, including methodology and locations studied, please refer to the following release.

"The Root System Research at the Four Rows of Ginkgo Trees," January 11, 2023 (in Japanese)

URL：https://www.jingugaienmachidukuri.jp/pdf/jingugaienmachidukuri_news_20230111.pdf

"The Second Root System Research at the Four Rows of Ginkgo Trees," January 9, 2024

URL：https://www.jingugaienmachidukuri.jp/pdf/en-jingugaienmachidukuri_news_2024010901.pdf

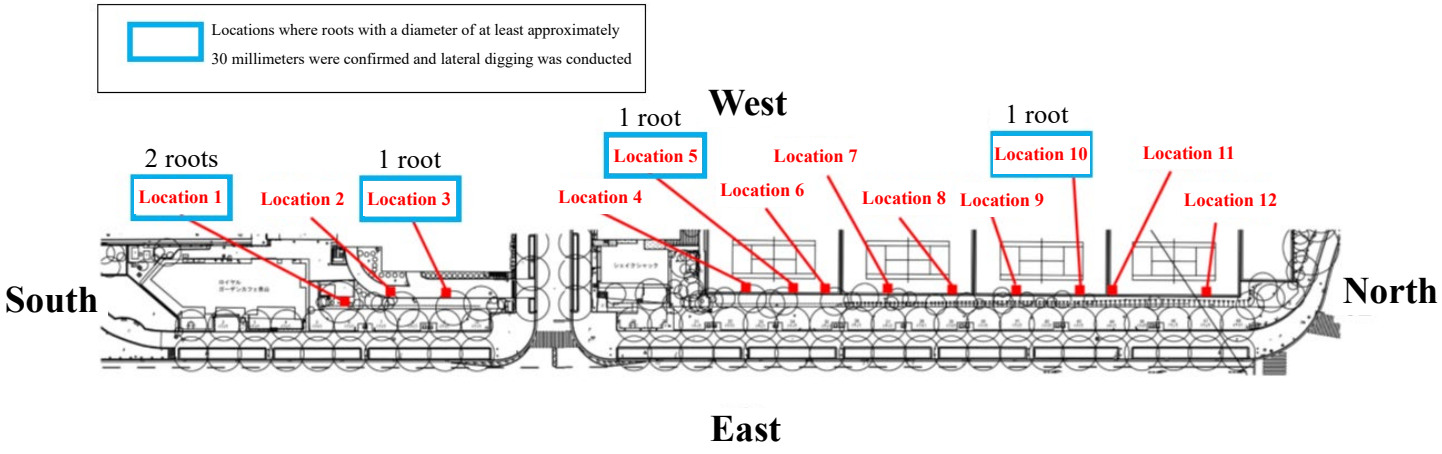
(2) Results of root system research

Results of the first and second root system research are as follows (See Table 2 and Figure 6)

Table 2: Results of root system research

	First root system research	Second root system research
Period	January 2023	January 2024
Location	Approx. 6.5 meters from the row of ginkgo trees (sidewalk curb)	Approx. 10.5 meters from the row of ginkgo trees (sidewalk curb)
Number of sites	10	12
Results	- Some of the roots could not be surveyed due to obstructions, so it was decided that a second survey will be conducted. - Also, there were no areas where more than four roots with a diameter of at least 30 millimeters were identified in a single survey section.	- All survey sections were confirmed to have fewer than four roots with a diameter of at least 30 millimeters and based on the criteria for making judgements in the environmental impact assessment report, it can be judged as acceptable to cut the roots at a distance of 10.5 meters. - Also, at all 12 locations where roots with a diameter of at least approximately 30 millimeters were confirmed, the progress of the roots was checked through lateral digging. Out of five roots, two ended within about 17.0 meters, two were assumed not to progress in a westerly direction, and one extended for about 22.0 meters, but it was confirmed that these roots did not have a circumference of at least 30 millimeters at the 17.0-meter point.

Figure 6: Locations where roots with a diameter of at least approximately 30 millimeters were confirmed in the second root system research



Based on the results of the above research, we have formulated the following additional preservation measures to create a better growing environment for the roots while also minimizing any negative impact.

(3) Extended setback width for the new baseball stadium and additional root preservation measures

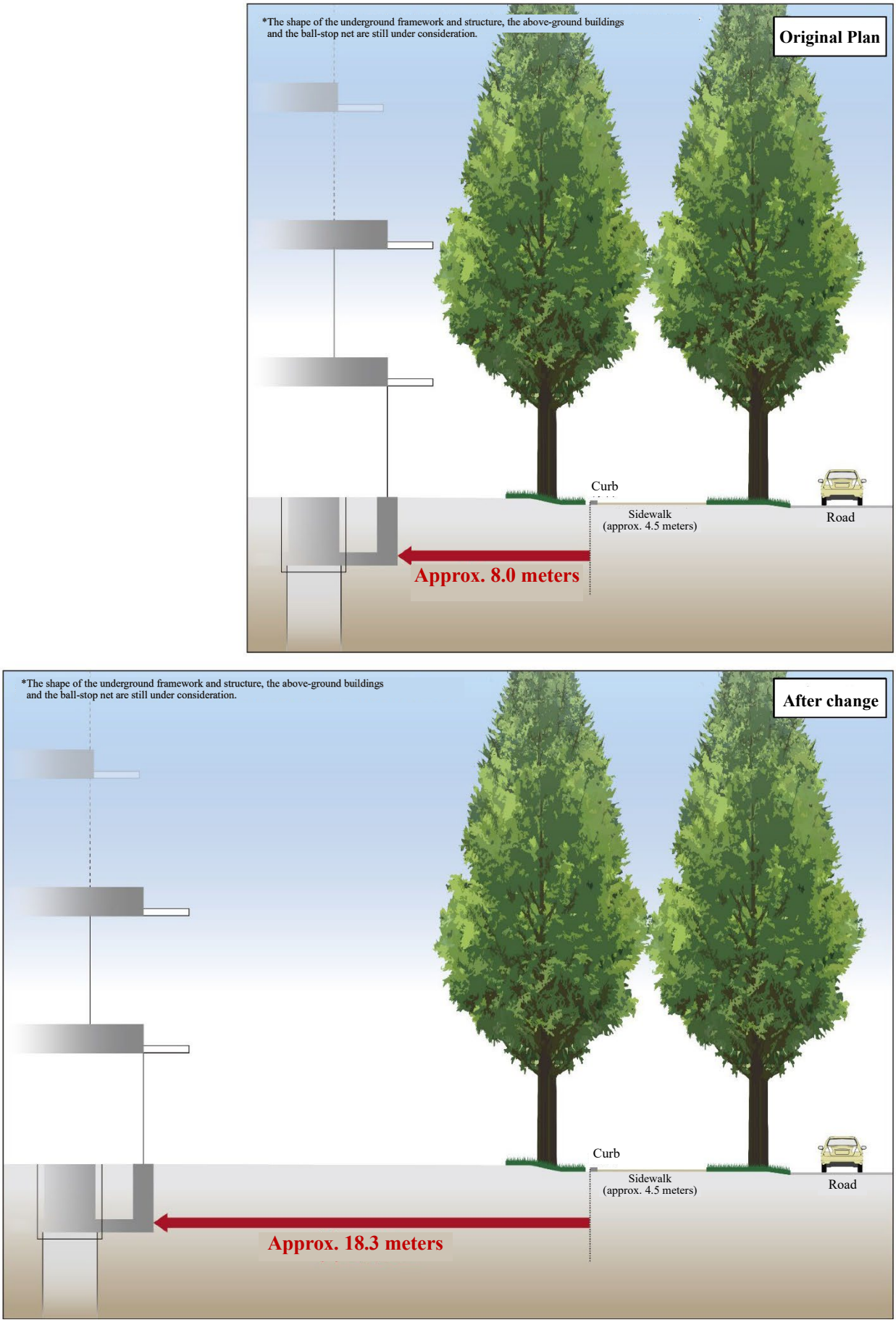
The results of the second root system research judged that there were no areas where more than four large roots with a diameter of at least approximately 30 millimeters were identified in a single survey section and that it was acceptable to cut the roots at a distance of around 10.5 meters. However, a total of five large roots with diameters exceeding

approximately 30 millimeters were identified at four* of the 12 survey sites. The five roots were identified to their tips using lateral digging*14. This confirmed that two had stopped growing at a distance of less than approximately 17.0 meters, two were assumed to not be growing to the west, and one had grown to approximately 22.0 meters but was less than 30 millimeters in diameter at approximately 17.0 meters. Under the criteria for making judgements in the environmental impact assessment report, it would be acceptable to cut these roots at a distance of around 10.5 meters. However, after conducting lateral digging and obtaining the opinions of tree doctors and other experts, we decided to set the root system protection area at approximately 17.0 meters from the sidewalk curb. Also, to secure an additional 1.3 meters of space during construction and to provide additional space for root system growth, the setback width has been extended from approximately 8.0 meters in the original plan to approximately 18.3 meters (Figure 7).

*14 A method of carefully digging to the root tips while taking care not to cut the roots

* September 11, 2024 postscript: The description of "three" has been corrected since the correct number of location is "four" as shown in Figure 6.

Figure 7: Simplified diagram of the root system protection area and the setback width to the underground framework for the baseball stadium

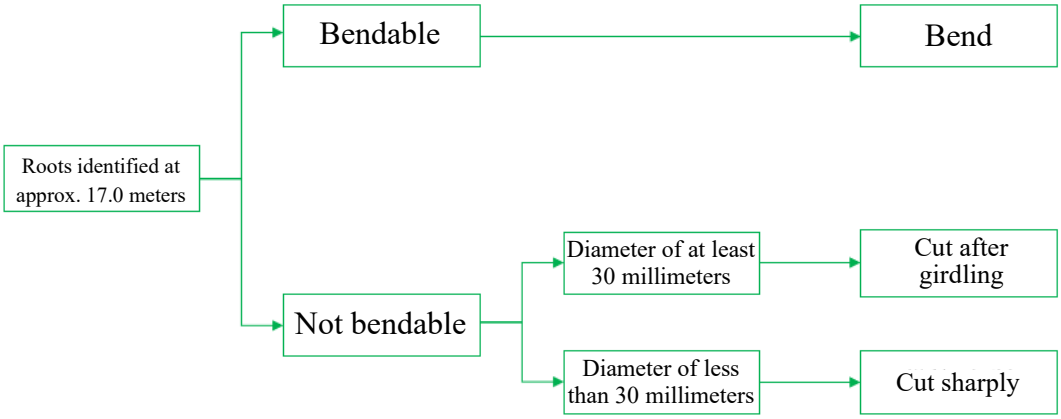


(i) Management of roots identified outside the root system protection area (approximately 17.0 meters)

Roughly one year before the start of construction of the new baseball stadium, all root growth will be checked at approximately 17.0 meters. If roots are identified at approximately 17.0 meters, tree doctors and other experts will be consulted to determine if the roots are bendable. If so, these roots will be bent to change the growth direction. Of roots judged to be unbendable, those with a diameter of at least 30 millimeters will be girdled*15 and then cut off one year later. Roots with diameters of less than 30 millimeters will be sharply cut off to encourage feeder roots to sprout. After girdling or cutting the roots, a root accelerator or similar agent will then be applied and a root system protection area secured.

*15 Method of removing the epidermis of roots of a certain thickness down to the formation layer to promote root growth from the stripped area and reduce the burden on the tree from root removal.

Figure 8: Management of roots identified at approx. 17.0 meters



(ii) Soil improvement

Soil improvement will be performed on an area roughly 10.5 meters to 18.3 meters from the rows of ginkgo trees (sidewalk curb) to create an environment conducive to root growth.

(iii) Measures to remediate the vitality

For ginkgo trees with declining vitality, irrigation, application of liquid fertilizer, removal of hedera, etc., and continued tree care based on the level of vitality, will create a better environment for the ginkgo trees to remediate their vitality.

The following measures to remediate the vitality of some of the ginkgo trees were implemented from April to June 2024. These measures are explained in a release published on July 26, 2024*16.

- Removal of hedera and undergrowth
- Soil improvement through hydraulic injection
- Laying of rice straw mulch
- Installation of an irrigation system
- Removal of roadbed of former road
- Installation of wood decking in the shops lining the road passing through the ginkgo tree rows

*16 “Measures to Remediate the Vitality of Ginkgo Trees (Implemented April-June 2024),” July 26, 2024
https://www.jingugaienmachidukuri.jp/pdf/en-jingugaienmachidukuri_news_2024072601.pdf

(4) Input from tree doctors and other experts

Root system research is being conducted by IBIDEN Greentec Co., Ltd. Based on the opinions of several tree doctors and other experts, research methods were reviewed and the results were analyzed before reaching our decision on this policy. Individuals who provided technical advice regarding root system research and tree monitoring and research, and advice and opinions on the setback width for the new baseball stadium, setting the scope of the root system protection area, and root protection policy, are listed below.

Satoshi Naoki
Naoki Technical Office, Director of the Society for Tree Ecology Research (NPO), engineer and tree doctor

Taisai Hori
Tree Application Research Center, Chief Advisor of the Society for Tree Ecology Research (NPO)

Kumiko Mito
Tree Cultivation Laboratory, part-time lecturer at Tokyo University of Agriculture and Hosei University, tree doctor

The following individuals provided guidance on ginkgo tree vitality research conducted in 2023.

Satoshi Naoki
Naoki Technical Office, Director of the Society for Tree Ecology Research (NPO), engineer and tree doctor

Hiroyuki Wada
Director and Vice Chairperson of the Japan Tree Doctors Association, Director and Vice Chairperson of the Tree Health Research Society, Japan, tree doctor

Nana Adachi
Auditor of the Society for Tree Ecology Research (NPO), tree doctor

Tadashi Touchi, Director of the International Society of Arboriculture and Director and the Urban Tree Diagnosis General Incorporated Association, provided a second opinion on these measures (full text is available at the following URL), based on the reports of the first and second root system research and on ginkgo tree vitality research conducted in 2023 and other reports.

Tadashi Touchi
Director of the International Society of Arboriculture and the Urban Tree Diagnosis General Incorporated Association, tree doctor

Second Opinion on the Survey of the Westernmost Row of the Four Rows of Ginkgo Trees and Preservation Measures Related to the Jingu Gaien District Type-1 Urban Redevelopment Project (in Japanese)
URL：https://www.jingugaienmachidukuri.jp/pdf/jingugaienmachidukuri_news_2024090903.pdf

■Survey reports

Jingu Gaien District Urban Redevelopment Project (Tentative Name): Root System Research Work – North-South on West Side of Gingko Trees (in Japanese)

URL：https://www.jingugaienmachidukuri.jp/pdf/jingugaienmachidukuri_news_2024090904.pdf

Jingu Gaien District Urban Redevelopment Project: Report on Ginkgo Tree Vitality Research – Annual Survey (in Japanese)

URL：https://www.jingugaienmachidukuri.jp/pdf/jingugaienmachidukuri_news_2024090905.pdf

Jingu Gaien District Urban Redevelopment Project: Second Root System Research Work – North-South on West Side of Gingko Trees (in Japanese)

URL：https://www.jingugaienmachidukuri.jp/pdf/jingugaienmachidukuri_news_2024090906.pdf

For inquiries regarding this release, please use the contact details below.
You can also submit questions about this project via the Q&A page on the project website using the URL below.
Responses to questions are posted on the website within about three weeks to one month.

URL：https://www.jingugaienmachidukuri.jp/en/faq/

Please direct inquiries to:
Jingu Gaien District Redevelopment Project Planning Office (Japanese language only)
Telephone: 03-6695-0539
Reception hours: Monday to Friday (excluding national holidays) 9am to 6pm
Jingu Gaien District Urban Redevelopment Project website: https://www.jingugaienmachidukuri.jp/en/

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