Baer Engineering
and Environmental Consulting, Inc.

July 29, 2015

City of Austin
Public Works Department
505 Barton Spring Rd #1300
Austin, TX 78704

Sent by email to Jules.Parrish@austintexas.gov.

Attention: Ms. Jules Parrish, MWR

Subject: **Tree Removal Plan**
Hornsby Bend Biosolids Management Plant Drying Ponds 1E, 1W, & 2
2210 South FM 973
Austin, Texas 78725
Baer Engineering Document No. 142069-8i.012

Dear Ms. Parrish:

Baer Engineering and Environmental Consulting, Inc. (Baer Engineering) is pleased to provide the attached Tree Removal Plan. Baer Engineering visited the Hornsby Bend Biosolids Management Plant (HBBMP) on June 3, 16, and 19, 2015. Based on our field observations and the Texas Commission on Environmental Quality's (TCEQ) mandated vegetation removal around the drying ponds at HBBMP, we have provided the attached Tree Removal Plan that includes 1) a tree survey of dead, diseased, and damaged trees, 2) details on removal of dead trees and pruning of damaged trees, and 3) a text document to accompany the tree survey and plan details methods. We have drafted our removal plan in a format that can be expanded upon for bidding purposes.

Baer Engineering thanks you for the opportunity to work on this project. If you have questions or comments about this document, please feel free to contact me at 707.616.8583 or dsperry@baereng.com.

Respectfully Submitted,
BAER ENGINEERING & ENVIRONMENTAL CONSULTING, INC.

David Sperry
Wildlife/Conservation Biologist

Attachment: Tree Removal Plan

Baer Engineering and Environmental Consulting, Inc.
7756 Northcross Drive, Suite 211, Austin, Texas78757
Phone: 512.453.3733 ♻ Fax 512.453.3316 ♻ Toll Free 800.926.9242
www.BaerEng.com

Tree Removal Plan

Hornsby Bend Biosolids Management Plant

Prepared for:

Austin Water Utility
2210 South FM 973
Austin, Texas 78725

Baer Engineering Project No. 142069-8.012
July 29, 2015

Baer Engineering and Environmental Consulting, Inc.
7756 Northcross Drive, Suite 211, Austin, Texas78757
Phone 512/453-3733 Fax 512/453-3316

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

Baer Engineering prepared this Tree Removal Plan report to supplement the tree survey. The tree survey identified 101 dead, diseased, and damaged trees on the berms of three evaporation ponds (1E, 1W, and 2) at the Hornsby Bend Biosolids Management Plant (HBBMP). The tree survey was conducted by MWM Design Group and is attached in **Appendix A**. This document provides a summary of the tree survey and additional instructions to facilitate proper removal and pruning of vegetation and berm repair. **Appendix B** provides instructions and example details on procedures for removing trees and stumps, pruning damaged trees, dewatering techniques, and repair methods for the pond berms. In order to quantify results and provide documentation of maintenance records the datasheets in **Appendix C** should be completed by the contractor conducting the scope of work. The scope of work described herein should be conducted between September 16 and March 14 in order to avoid violating the Migratory Bird Treaty Act (MBTA). If work must occur between March 15 and September 15, the contractor will need to follow the MBTA Compliance document provided under a separate cover.

The HBBMP received a Notice of Violation (NOV) from Texas Commission on Environmental Quality (TCEQ) on March 16, 2015. The violation stated HBBMP failed to adequately prevent the proliferation of trees on the berms of evaporation ponds 1E, 1W, and 2.

Baer Engineering recommends subcontracting the following scope of work to a qualified landscaping company:

1. Remove the 10 small-diameter trees (≤6 inch) identified in this document. Five of these trees will require approval from the COA Arborist. Treat and paint stumps with glyphosate to prevent sprouting;
2. Fell the 42 snags identified in this document, excavate 25 root systems, dewater as necessary;
3. Excavate the 32 stumps and root systems identified in this document, dewater as necessary;
4. Repair berm immediately after excavations;
5. Paint the remaining 23 dead stumps identified in this document with polyurethane to slow decomposition;
6. Prune the 11 damaged trees identified in this document; and
7. Haul and properly dispose of debris off-site.

This document provides the necessary steps and methods to address this portion of the TCEQ's NOV.

2.0 INTRODUCTION AND PURPOSE

The existing vegetation along the evaporation pond berms at HBBMP provides aesthetic and ecological value to the venue. However, this vegetation can also compromise the integrity of the berm. Plant roots grow into the structure, loosening compacted soil through root penetration, and creating seepage paths and internal erosion issues from decaying roots.

Water infiltrating the pond berms can be valuable in small amounts and detrimental in large amounts. A small amount of moisture in the soil is good as it acts as glue, holding the soil particles together because of the high surface tension of water. A large amount of water in the dam can be detrimental because it increases the space between the soil particles, reducing friction between them. In this situation the water acts as a lubricant, reducing the cohesion of the structure. In addition, root channels create pathways for water flow. These pathways grow over time, through erosion.

The HBBMP received a NOV after a Compliance Evaluation was conducted by the TCEQ on March 16, 2015. The violation stated HBBMP failed to adequately prevent the proliferation of trees on the berms of evaporation ponds 1E, 1W, and 2. One of the TCEQ's recommendations was:

- Begin removing dead, diseased, and small trees on or near the embankment of the ponds. All tree removal should be conducted above the water table of the ponds to minimize the potential of unauthorized discharges and to prevent decaying roots from compromising the hydraulic integrity of the embankments.

This document provides the necessary information and methods to accomplish this recommendation.

Keeping the hydraulic integrity of the berms is paramount. All excavation will occur above the current water level unless a dewatering plan is employed prior to the start of excavation. Felling of standing dead and live trees shall occur in such a manner as to prevent contact with the pond liner and submerged portions of the berms. Dead wood currently in the pond is to be left undisturbed, to avoid damaging the pond liner.

In May 2015, MWM Design Group surveyed diseased, dead, and damaged trees on the embankment of the ponds above the water line or within 10 feet of the top of the berms. On June 3, 2015, Mr. David Sperry and Ms. Jennifer Lueckemeyer, both of Baer Engineering, visited the HBBMP and conducted a migratory bird nest survey. On June 16, 2015, Ms. Lueckemeyer revisited the site and reviewed the tree survey. On June 19, 2015, Mr. James Clark, of Baer Engineering, collected additional information on the surveyed trees. The results of these site visits are incorporated into this Tree Removal Plan.

3.0 SMALL TREE REMOVAL

Ten immature live trees with damaged branches were identified on the berms of the evaporation ponds. The stems of these trees are equal to or less than six (6) inches in diameter at breast height (DBH). These trees will be cut flush with the ground. Immature trees of this size typically do not have a substantial root system and are not expected to impact the berm. As the trees are cut down, they must fall on the berm and not into the water. Each stump will then be immediately treated with glyphosate. The woody debris resulting from this work will be properly removed following direction from HBBMP staff. Additional instructions on felling and stump management are provided in the next section.

Removal of five trees will require an approved permit from the City Arborist for removal. Mitigation may be a condition of the permit approval process. The mitigation for these small diameter trees will be 25% of the total DBH. Mitigation is waived for trees that are dead.

The following trees are listed on the Tree Survey. The trees were tagged with individual numbers. Refer to the Tree Survey plan sheets for the location of these trees.

Table 1. A list of small diameter trees that will be cut flush with the ground. The remaining stumps will be properly treated with glyphosate.

Tree Tag (Tree Survey page #)	Common Name	Stem sizes (DBH)	Mitigation Required
566 (18)	Boxelder Ash Maple	6 / 6 / 5 / 4	Yes
567 (18)	Hackberry	6 / 3	No
568 (19)	Hackberry	5 / 5 / 5 / 5 / 4 / 3	Yes
574 (20)	Jerusalem Thorn	5 / 3 / 2	Yes
583 (22)	Jerusalem Thorn	5 / 4	No
584 (22)	Jerusalem Thorn	5 / 4	No
585 (22)	Hackberry	6 / 5	Yes
587 (23)	Jerusalem Thorn	6 / 4 / 3	Yes
591 (24)	Hackberry	6	No
594 (24)	Hackberry	6	No

4.0 METHODS FOR SMALL TREE MANAGEMENT

Standing trees will be cut flush with the ground. The trees need to fall on the berm of the ponds and not in the water. Felling trees into the water could damage the liner of the ponds and result in water quality violations. The remaining stump will be treated with glyphosate to prevent sprouting.

4.1 Felling Immature Live Trees

The contractor shall directional fell the small diameter live trees onto the earthen berms. Trees should not be felled into the ponds. Felling may be accomplished through a single cut because of the small size of these trees., However, if a single cut is not feasible, please refer to Section 6.1 on felling trees using a directional notch and a felling cut. The remaining stump will be flush with the ground.

Once the tree is down, cut it into pieces that can be loaded into a hauler and disposed of using appropriate methods.

4.2 Stump Management for Live Trees

Leaving a stump from a live tree is not ideal because the stump will likely re-sprout. Within five minutes of the final flush cut, glyphosate will be brushed, with a disposable paint brush, onto the top of the stump, as depicted in **Figure 1**. The herbicide will be applied by a licensed applicator. The contractor will follow the manufacturer's instructions on applying the proper concentration of the herbicide. The minimum amount of glyphosate should be used to completely cover the top of the stump. Care should be taken to treat only the target stump. The herbicide should not affect the surrounding vegetation or water.

Figure 1. Example of applying glyphosate to a fresh cut stump with paint brush.

5.0 DEAD TREE AND STUMP REMOVAL

The following is a list of 42 dead trees (snags) and 38 stumps that were surveyed. Twenty-five snags and 32 of the stumps will be removed from the berms and their roots excavated. Seventeen snags will be felled and the remaining stump, along with six existing stumps, will be not be removed because of their close proximity to other large diameter (>6-inch DBH) live trees. Removing these 23 stumps may result in critically damaging the root zone of the live trees. Root excavation may require the installation of a cofferdam and dewatering. All work will occur either above the water level of the ponds or within a dewatered area. Additional instructions on felling, excavation and dewatering are provided in the next section. The trees were tagged with individual numbers. Refer to the tree survey for the locations of these trees.

Table 2. A list of dead trees and stumps that require removal.

Tree Tag (Tree Survey page #)	Description	Stem sizes (DBH)	Felling required	Paint Stump or Excavate Roots	Dewatering Required[1]
509 (14)	Dead tree	12 / 10	Yes	Excavate	No
510 (14)	Dead tree	9 / 9 / 10	Yes	Excavate	Yes
513 (14)	Dead tree	9 / 10	Yes	Excavate	Yes
514 (14)	Hackberry	6	Yes	Excavate	No
515 (14)	Dead tree	8	Yes	Excavate	No
516 (14)	Dead tree (on ground)	7	No	Excavate	No
517 (14)	Dead tree (on ground)	12	No	Excavate	Yes
518 (14)	Dead tree (on ground)	8	No	Excavate	No
520 (14)	Hackberry	7	Yes	Excavate	No
521 (14)	Hackberry	10 / 9	Yes	Excavate	Yes
522 (14)	Hackberry	13	Yes	Excavate	Yes
523 (14)	Hackberry	5	Yes	Excavate	No
524 (14)	Hackberry	12	Yes	Excavate	Yes
526 (14)	Dead Hackberry (on ground)	10 / 4	No	Excavate	Yes
527 (14)	Hackberry	19	No	Excavate	Yes
528 (14)	Hackberry	19	Yes	Excavate	Yes
529 (13)	Hackberry	12	Yes	Excavate	No
530 (13)	Hackberry	14 / 13	No	Excavate	Yes
531 (13)	Hackberry	18 / 10 / 5	Yes	Excavate	Yes
535 (13)	Hackberry	11 / 6	No	Excavate	No
536 (13)	Hackberry	12 / 10	No	Excavate	No
537 (13)	Hackberry	11 / 8 / 5	No	Excavate	Yes
538 (12)	Hackberry	9 / 9 / 5	Yes	Excavate	Yes
539 (12)	Hackberry	12 / 11 / 10	Yes	Excavate	Yes
540 (12)	Hackberry	10 / 10 / 6	Yes	Excavate	Yes
541 (12)	Hackberry	14 / 11	Yes	Excavate	Yes
542 (12)	Hackberry	12	Yes	Excavate	Yes
543 (12)	Hackberry	12	No	Paint	No
544 (12)	Hackberry	10	Yes	Paint	No
545 (12)	Hackberry Stump	9 / 9	No	Paint	No
546 (12)	Hackberry	16 / 12 / 11 / 10	Yes	Paint	No
547 (12)	Mulberry	3 / 3 / 2 / 1 / 1	Yes	Paint	No
548 (11)	Hackberry	11 / 10 / 9 / 9	Yes	Excavate	No
549 (11)	Hackberry	18	Yes	Paint	No
550 (10)	Jerusalem Thorn	10 / 8 / 6	Yes	Paint	No
551 (10)	Mulberry	5 / 3 / 2	Yes	Paint	No

Tree Tag (Tree Survey page #)	Description	Stem sizes (DBH)	Felling required	Paint Stump or Excavate Roots	Dewatering Required[1]
552 (10)	Mulberry	6	Yes	Excavate	No
553 (10)	Mulberry Stump	22	No	Excavate	Yes
554 (10)	Hackberry	10 / 10 / 6	Yes	Excavate	Yes
555 (9)	Hackberry	2	Yes	Paint	No
556 (9)	Hackberry	3	Yes	Paint	No
570 (19)	Jerusalem Thorn	7	Yes	Paint	No
571 (19)	Hackberry	3	Yes	Paint	No
577 (21)	Jerusalem Thorn	7	Yes	Paint	No
581 (21)	Jerusalem Thorn	10	Yes	Paint	No
588 (24)	Honey Mesquite	3	No	Excavate	No
589 (24)	Hackberry	7	Yes	Excavate	No
595 (24)	Hackberry	3 / 3	Yes	Paint	No
596 (25)	Hackberry	2	Yes	Paint	No
597 (25)	Hackberry	6	Yes	Paint	No
598 (25)	Jerusalem Thorn	7	Yes	Paint	No
599 (6)	Hackberry Stump	8	No	Paint	No
600 (6)	Mulberry	3 / 3	No	Paint	No
601 (6)	Dead Jerusalem Thorn (on ground)	6 / 4	No	Paint	No
602 (7)	Jerusalem Thorn Stump	6	No	Excavate	No
603 (8)	Jerusalem Thorn Stump	4 / 4 / 3 / 3	No	Excavate	No
604 (8)	Jerusalem Thorn	4	Yes	Excavate	No
605 (8)	Jerusalem Thorn	2 / 2	No	Excavate	No
606 (8)	Jerusalem Thorn	3	No	Excavate	No
607 (8)	Mulberry Stump	2 / 1 / 1 / 1 / 1	No	Excavate	No
608 (8)	Jerusalem Thorn Stump	3	No	Excavate	No
609 (8)	Hackberry	4	Yes	Excavate	No
610 (8)	Jerusalem Thorn Stump	3 / 2	No	Excavate	No
611 (8)	Hackberry Stump	3	No	Excavate	No
612 (8)	Hackberry Stump	2	No	Excavate	No
613 (8)	Jerusalem Thorn Stump	3	No	Excavate	No
614 (8)	Jerusalem Thorn Stump	4	No	Excavate	No
615 (8)	Jerusalem Thorn Stump	3	No	Paint	No
616 (8)	Jerusalem Thorn Stump	4	No	Paint	No
617 (8)	Jerusalem Thorn Stump	2	No	Excavate	No
618 (8)	Hackberry Stump	6	No	Excavate	No
619 (8)	Dead Hackberry (on ground)	5	No	Excavate	No
620 (8)	Hackberry Stump	3	No	Excavate	No
621 (8)	Jerusalem Thorn	8	Yes	Paint	No
632 (14)	Hackberry	20	Yes	Excavate	Yes
633 (15)	Hackberry	6	No	Excavate	No
634 (15)	Hackberry Stump	12	No	Excavate	No
635 (15)	Hackberry	4 / 4 / 4	No	Excavate	No
636 (15)	Hackberry	9 / 8 / 7	No	Excavate	Yes
637 (15)	Pecan Stump	12	No	Excavate	Yes

[1] Dewatering may be required for additional excavation, contractor will make final decisions on dewater requirements.

6.0 METHODS FOR DEAD TREE AND STUMP MANAGEMENT

Eighty dead trees and stumps were tagged for removal. Standing dead trees will be cut to approximately 2 feet above ground level. The trees need to fall onto the berm of the ponds and not into the water. Felling trees in the water could damage the liner of the ponds and result in water quality violations. The remaining stump and root system will either be excavated using hand tools or painted with polyurethane to slow the decaying process. Root systems that are located in close proximity to the water level of the ponds will require a dewatering plan. If water is encountered during excavation, a dewatering plan will need to be implemented before continuing excavation. A layer of bentonite clay will be placed in the excavation and native soil free of debris will fill the remaining excavation. The following steps provide supplemental information to the detail sheets that are included in the tree removal plan set.

6.1 Felling trees

The contractor will fell the dead trees onto the earthen berms. Trees should not be felled into the ponds. If felling the tree in a direction away from the ponds is difficult because of the slope, a winch should be used to help control the fall. Trees should not fall across the berms and into an adjacent evaporation pond. Multiple cuts may be required for tall trees. Directional felling requires three separate cuts. These cuts are explained below and graphically depicted in the attached detail sheet in **Appendix B**.

6.1.1 Directional notch

The directional notch comprises a top cut and bottom cut. The first cut is the top cut and it determines the direction of the fall. The top cut should be at a 45° angle from the horizontal. The second cut is referred to as the bottom cut. The bottom cut is a horizontal cut which meets the top cut. The directional notch depth should equal ¼ of the tree diameter.

6.1.2 Felling Cut

The third cut, felling cut, will occur on the opposite side of the tree from the directional cut. This cut can either be a straight cut from behind the notch cut, typically used for smaller trees, or the person operating the chainsaw can use a bumper spike. Both techniques should use a felling wedge for larger trees to prevent pinching of the guide bar. Both types of cuts will be 2 inches above the corner of the notch cut.

Once the tree is down, cut it into pieces that can be loaded into a hauler and dispose of properly.

6.2 Stump Management

Leaving stumps in place is not ideal because it will be necessary to manage the decaying roots in the near future. There are two methods for managing stumps at HBBMP: 1) painting the stump, and 2) excavating the stump and roots. Some stumps are at the water's edge and will require a dewatering plan. This section provides methods for managing the stumps at HBBMP.

6.2.1 Painting a Stump

For those stumps whose root system overlaps with adjacent live trees, the contractor will treat the stump with polyurethane to slow the decaying process. This stump will be removed in subsequent years in conjunction with the removal of the adjacent trees.

6.2.2 Excavating a Stump and its Roots

The decaying roots of woody species can create channels into the evaporation pond berms comprising the berm's integrity. Hand tools only will be used to dig around the base of the stump exposing the root ball. The stump and root ball should be pulled using a winch to loosen

the root ball. Continue to use hand tools to grub around the base of the stump and pull with a winch until the stump and root ball are removed. Once the stump is removed, grub out any remaining roots larger than 2 inches in diameter. If water or saturated soil is encountered during excavations, cut exposed roots and begin berm repair.

6.2.3 Dewatering Plan

A temporary dewatering plan will be required for those root systems near the water table. Sufficient size and capacity of the dewatering system is necessary to lower and maintain the water table and to allow material to be excavated in a reasonably dry condition. Dewatering will be accomplished through the use of cofferdams, or equivalent. An example is the use of flexible intermediate bulk containers (FIBC), or bulk bags. An FIBC is depicted in **Figure 2**. If this method is selected, bags will be filled with clean gravel or sand and positioned to form a cofferdam that isolates the work area. Once the FIBC are in place, a pump will be used to dewater the area inside the cofferdam. Polyethylene tarps may be required inside the cofferdam to further seal the work area.

Figure 2. Example of FIBC.

The dewatering system will be operated continuously until repair of the berm is completed. The water removed from the excavation should be disposed of in such a manner as will not endanger portions of work under construction. We suggest pumping the water back into the evaporation pond. Once the stump and roots have been excavated and the berm has been repaired, the FIBC or bulk bags should be removed. Their contents should be disposed of properly.

6.3 Berm Repair

The void resulting from the root excavation should be cleared of loose soil. Slopes should not be steeper than 1:1 (45°). A 4-inch layer of bentonite clay will be layered along the bottom and sides of the excavation. This can be accomplished through the use of dry granules, dry pellets, or select clay. The bentonite will be wetted and compacted before backfilling the excavation in 6-inch lifts of native soils, free of rocks and debris. Soil shall comply with COA Specification 601S. Compact each 6-inch layer using manually operated compaction equipment or compaction equipment attached to a backhoe. The backfill must be compacted to a minimum of 95% of the maximum dry density as determined by ASTM D-698. The backfill should then be graded to blend with the surrounding contour and seeded following the COA Standard Specification 604S Seeding for Erosion Control on all disturbed areas above the water table.

Please check with the COA website for the current Specifications.

7.0 PRUNING DAMAGED AND DEAD TREE LIMBS

The remaining 11 trees on the tree survey are either damaged or have dead limbs that require pruning. Damaged limbs need to be pruned to prevent disease from infecting the tree. The dead limbs need to be removed for safety, and to prevent falling limbs from damaging the berms or pond liners.

Table 3. A list of damaged trees or trees with dead limbs that require pruning.

Tree Tag (Tree Survey page #)	Description	Stem sizes (DBH)
569 (19)	Hackberry	10
572 (19)	Hackberry	12 / 11 / 10 / 6 / 5
573 (19)	Hackberry	10
575 (20)	Hackberry	13 / 3
576 (20)	Jerusalem Thorn	17
578 (21)	Hackberry	7
579 (21)	Hackberry	7
580 (21)	Jerusalem Thorn	9 / 7
582 (21)	Jerusalem Thorn	11 / 10 / 3
586 (23)	Hackberry	10 / 10 / 6
590 (24)	Hackberry	7 / 7 / 6 / 6 / 5

8.0 METHODS FOR PRUNING DAMAGED AND DEAD LIMBS

Eleven trees with damaged or dead limbs were tagged for pruning. The first cut will notch the underside of the limb several inches from the trunk. The second cut will be farther out on the limb, starting on the underside and continuing straight through. This will leave a manageable stub out to cleanly dress the wound. The final cut will occur just beyond the branch bark collar and branch bark ridge. Pruning should not damage either the branch bark collar or branch bark ridge. The cut begins outside the branch bark ridge and angles down away from the stem of the tree, avoiding injury to the branch collar. The cut should be as close as possible to the stem but outside of the branch bark ridge, so that stem tissue is not injured and the wound can seal in the shortest possible time. A visual explanation of proper pruning techniques are provided in the attached details located in **Appendix B**.

9.0 PREVENTION OF PROLIFERATION OF NEW TREES

A Tree Management Plan was prepared under separate cover. The Tree Management Plan describes in detail the options for HBBMP to prevent the proliferation of new trees along the berms of the evaporation ponds. This section provides a brief outline of the management options detailed in the Tree Management Plan.

9.1 Maintenance Activities

- Wait for live trees to die and remove the trees and root system in a manner consistent with this Tree Removal Plan;
- Remove shrubs and vines growing on the berms;
- Use hand tools, saws, or weed wrench to remove small diameter (≤6 inches) woody plants that are growing on the berms;
- Try to re-establish some type of grass as a ground cover where soil is exposed;
- Mow the berms twice a year, once in late September and again in early March; and
- Keep records of inspection and maintenance activities on an annual basis.

Vegetation, including trees, shrubs, and grasses in the project area may provide habitat for migratory birds. Vegetation maintenance, including removing trees (dead or live), shrubs, and mowing grass around the evaporation ponds, should occur between September 16 and March 14, to avoid disturbance of migratory birds and their nests.

9.0 SEQUENCE OF ACTIVITIES

The following is the sequence of tree removal activities at HBBMP:

1. Cut the 10 small diameter trees (≤6 inch), identified in Table 1, flush with the ground;
2. Apply glyphosate to the live stumps to prevent sprouting;
3. Haul and properly dispose of debris off-site;
4. Fell the 42 snags identified in Table 2;
5. Haul and properly dispose of debris;
6. Paint 23 dead stumps, identified in Table 2, with polyurethane to slow decomposition;
7. Excavate the stumps and root systems that do not require a dewatering plan;
8. Repair berm immediately after each extraction;
9. Haul and properly dispose of debris;
10. Install cofferdams around stumps that require dewatering, identified in Table 2.
11. Excavate the stumps and root systems that require a dewatering plan;
12. Repair berm immediately after each extraction;
13. Remove cofferdams;
14. Haul and properly dispose of debris;
15. Prune the 11 trees with damaged and dead limbs, identified in Table 3; and
16. Haul and properly dispose of debris.

10.0 QUANTIFY RESULTS

In order to quantify results and provide documentation of maintenance records, the contractor shall fill out the datasheets in **Appendix C**.

11.0 PUBLIC NOTIFICATION

The Hornsby Bend Bird Observatory (HBBO) is located at the HBBMP. The HBBO is a program of the Austin Water Utility's Center for Environmental Research. HBBMP is known for its biodiversity and ecotourism, and is likely one of the best birding sites in central Texas. Bird watchers are present year round, and monthly bird surveys are conducted on the 2nd Saturday of each month.

Baer Engineering recommends all tree removal activities described in this document be scheduled in advance and public notifications of those schedules be posted at Hornsby Bend in the Center for Environmental Research. The Coordinator of the Center for Environmental Research at Hornsby Bend, Kevin Anderson, Ph.D., should be consulted for scheduling and appropriate public outreach coordination.

We suggest including the following information to the public:

1. Justification for maintenance (e.g. protection of water quality);
2. Removal techniques which will be implemented (chainsaw, pruning etc.);
3. Schedule and location(s) for tree removal activities; and
4. Contact information for HBBMP staff responsible for contractor.

12.0 QUALIFICATIONS

Field work was performed on June 3, 16, and 19, 2015. Conditions observed, during field work, may not reflect site conditions during other parts of the year. Baer Engineering assessed the potential impacts based on information provided to us by the COA and HBBMP. Subsequent changes in maintenance plans and specific maintenance methods are not covered in this plan.

David Sperry M.S.
Wildlife/Conservation Biologist

Rosemary Wyman, P.G. CHMM, CPESC
Executive Vice President

Jennifer Lueckemeyer, CPESC
Environmental Scientist

Appendix A:
Tree Survey

TREE TABLE	
TREE #	DESCRIPTION
509	17"TREE(12/10) (DEAD)
510	19"TREE(2-9/10) (DEAD)
513	14"TREE(9/10) (DEAD)
514	6" HACKBERRY
515	8"TREE(DEAD)
516	7"TREE(DEAD)
517	12"TREE(DEAD)
518	8"TREE(DEAD)
520	7" HACKBERRY
521	15" HACKBERRY (10/9)
522	13" HACKBERRY
523	5" HACKBERRY
524	12" HACKBERRY
526	12" HACKBERRY (10/4) (ON GROUND)
527	19" HACKBERRY
528	19" HACKBERRY
529	12" HACKBERRY
530	20" HACKBERRY (14/13)
531	25" HACKBERRY (18/10/5)
535	14" HACKBERRY (11/6)
536	17" HACKBERRY (12/10)
537	18" HACKBERRY (11/8/5)
538	16" HACKBERRY (2-9/5)

TREE TABLE	
TREE #	DESCRIPTION
539	23" HACKBERRY (12/11/10)
540	18" HACKBERRY (2-10/6)
541	20" HACKBERRY (14/11)
542	12" HACKBERRY
543	12" HACKBERRY
544	10" HACKBERRY
545	14" HACKBERRY (2-9) (STUMP)
546	33" HACKBERRY (16/12/11/10)
547	6" MULBERRY (2-3/2/2-1)
548	25" HACKBERRY (11/10/2-9)
549	18" HACKBERRY
550	17" JERUSALEM THORN (10/8/6)
551	8" MULBERRY (5/3/2)
552	6" MULBERRY
553	22" MULBERRY (STUMP)
554	18" HACKBERRY (2-10/6)
555	2" HACKBERRY
556	3" HACKBERRY
566	14" BOXELDER ASH MAPLE (6/6/5/4)
567	8" HACKBERRY (6/3)
568	16" HACKBERRY (4-5/4/3)
569	10" HACKBERRY
570	7" JERUSALEM THORN

TREE TABLE	
TREE #	DESCRIPTION
571	3" HACKBERRY
572	28" HACKBERRY (12/11/10/6/5)
573	10" HACKBERRY
574	8" JERUSALEM THORN (5/3/2)
575	15" HACKBERRY (13/3)
576	17" HACKBERRY
577	7" JERUSALEM THORN
578	7" HACKBERRY
579	7" HACKBERRY
580	12" JERUSALEM THORN (9/7)
581	10" JERUSALEM THORN
582	18" JERUSALEM THORN (11/10/3)
583	7" JERUSALEM THORN (5/4)
584	7" JERUSALEM THORN (5/4)
585	8" HACKBERRY (6/5)
586	18" HACKBERRY (2-10/6)
587	10" JERUSALEM THORN (6/4/3)
588	3" MESQUITE HONEY
589	7" HACKBERRY
590	19" HACKBERRY (2-7/2-/6/5)
591	6" HACKBERRY
594	6" HACKBERRY
595	5" HACKBERRY (3/3)

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

1

1 OF 30

TREE TABLE	
TREE #	DESCRIPTION
596	2" HACKBERRY
597	6" HACKBERRY
598	7" JERUSALEM THORN
599	8" HACKBERRY (STUMP)
600	4" MULBERRY (2-3)
601	8" JERUSALEM THORN (6/4)(ON GROUND)
602	6" JERUSALEM THORN (STUMP)
603	9" JERUSALEM THORN (2-4/2-3)(STUMP)
604	4" JERUSALEM THORN
605	3" JERUSALEM THORN (2-2)
606	3" JERUSALEM THORN
607	4" MULBERRY 2/1/1/1/1
608	3" JERUSALEM THORN (STUMP)
609	4" HACKBERRY
610	4" JERUSALEM THORN (3/2) (STUMP)
611	3" HACKBERRY (STUMP)
612	2" HACKBERRY (STUMP)
613	3" JERUSALEM THORN (STUMP)
614	4" JERUSALEM THORN (STUMP)
615	3" JERUSALEM THORN (STUMP)
616	4" JERUSALEM THORN (STUMP)
617	2" JERUSALEM THORN (STUMP)
618	6" HACKBERRY (4/3) (STUMP)

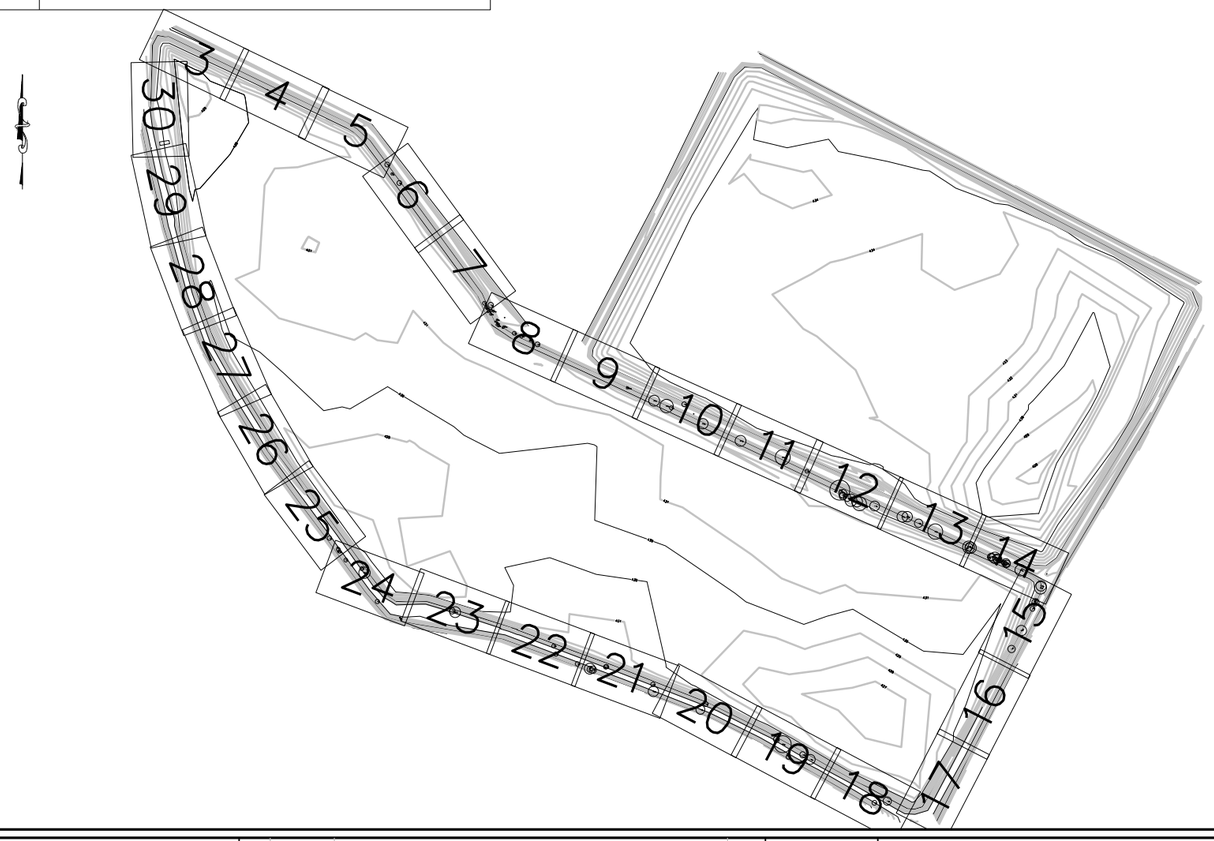
TREE TABLE	
TREE #	DESCRIPTION
619	5" HACKBERRY (4/2) (ON GROUND)
620	3" HACKBERRY (STUMP)
621	8" JERUSALEM THORN
632	20" HACKBERRY
633	6" HACKBERRY
634	12" HACKBERRY (STUMP)
635	8" HACKBERRY (3-4)
636	17" HACKBERRY (9/8/7)
637	12" PECAN (STUMP)

NOTES:

THE COORDINATES SHOWN ARE BASED ON THE TEXAS STATE PLANE, CENTRAL ZONE NAD83(2011)(EPOCH: 2010.0000), MODIFIED TO SURFACE VALUES, USING A SURFACE ADJUSTMENT FACTOR (SAF) OF 1.00004, SURFACE DATA IS MOVED TO GRID LOCATION USING CONTROL POINT 4 N=10054289.265, E=3142993.215.

ONLY DISEASED OR DEAD TREES ON THE EMBANKMENT OF THE PONDS ABOVE WATER LINE OR WITHIN 10' FROM THE TOP OF BERM ARE SHOWN. ALL TREES SHOWN ARE DISEASED UNLESS DESIGNATED "DEAD" OR "STUMP".

CONTOURS SHOWN ON THIS DRAWING WERE PROVIDED BY THE CLIENT. SURVEY PERFORMED BY MACIAS & ASSOCIATES, LP DATED JAN 3 – FEB 16, 2011



File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

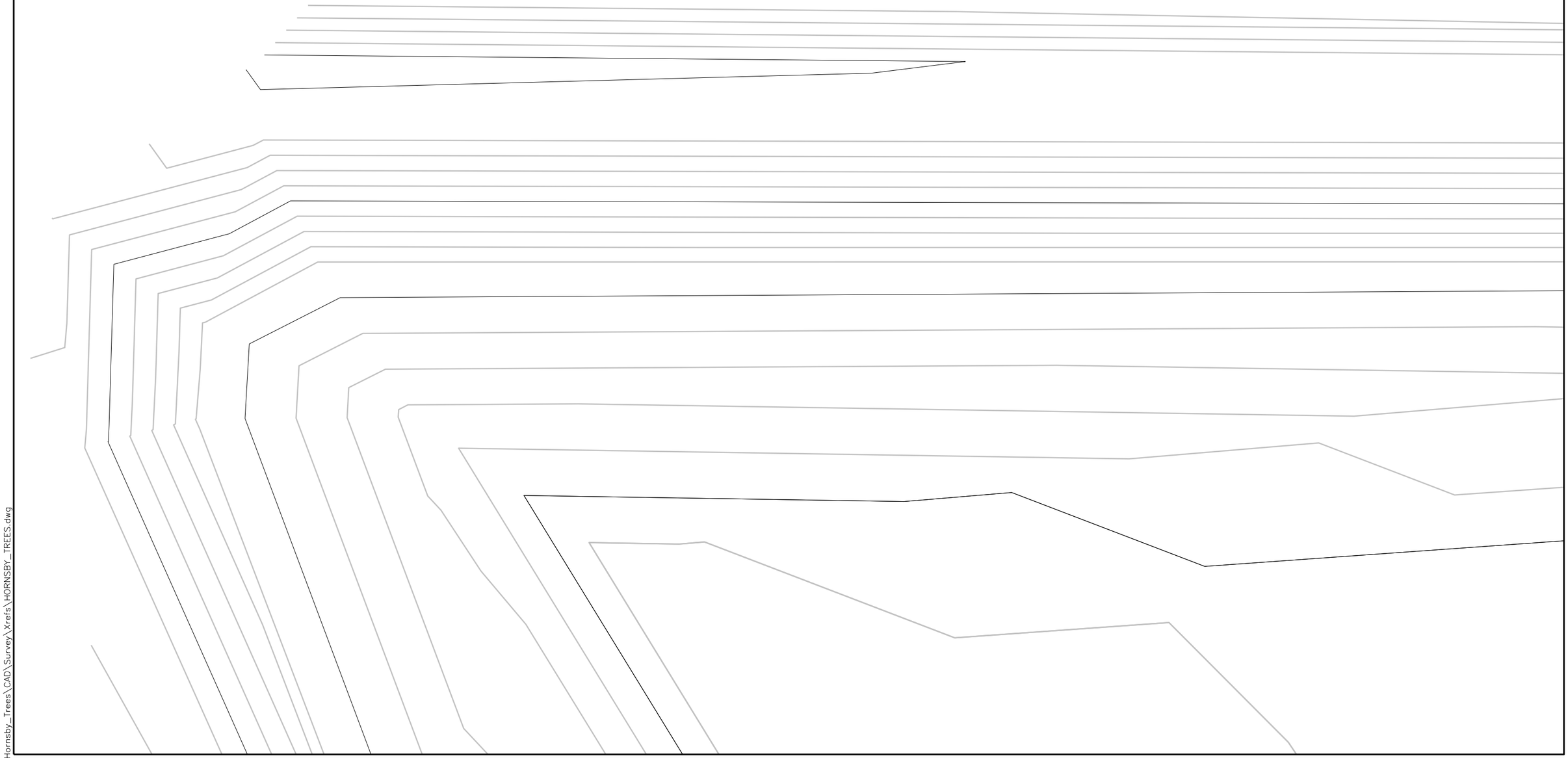
AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

2

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE



File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

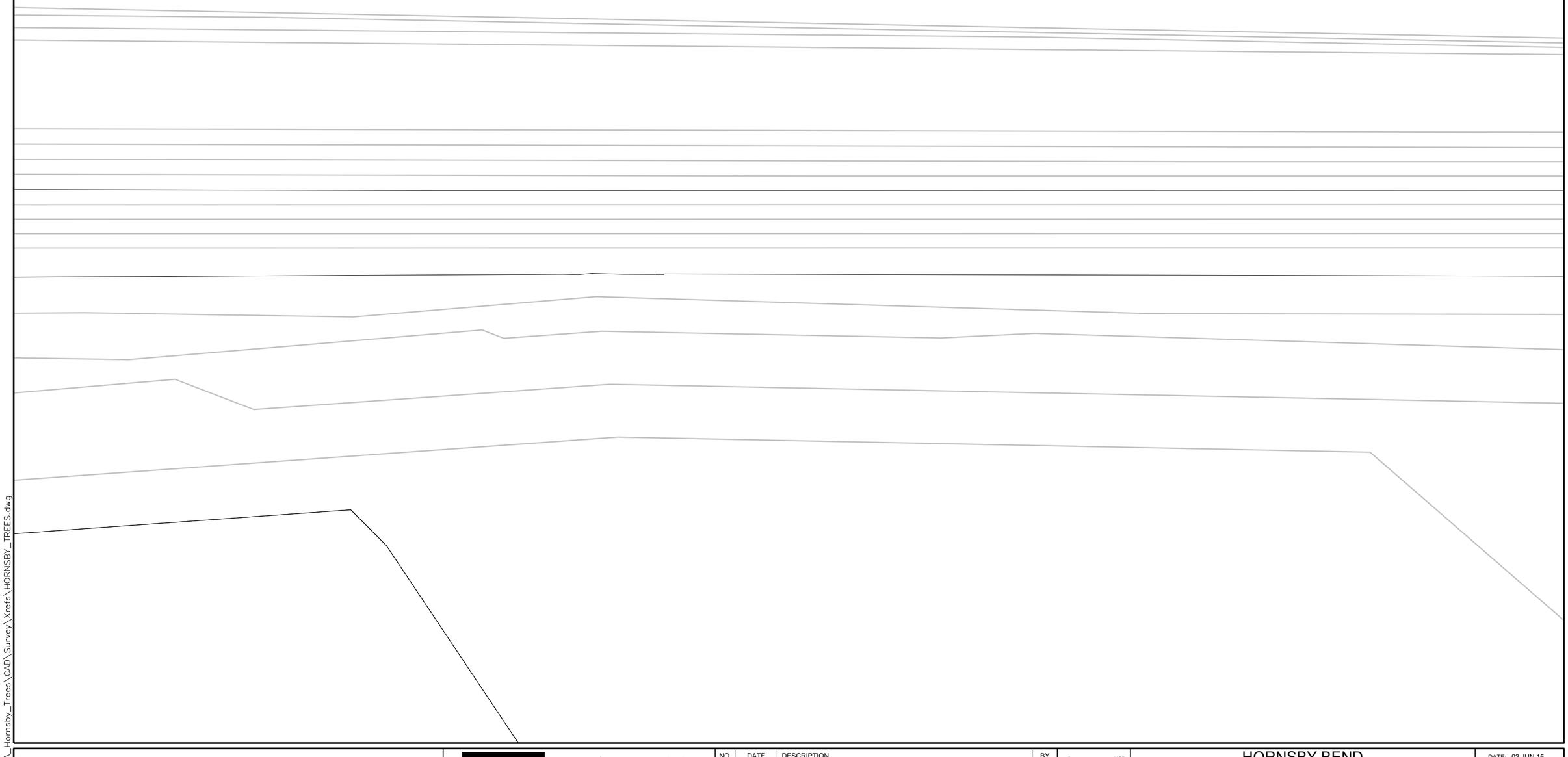
AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

3

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE



mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

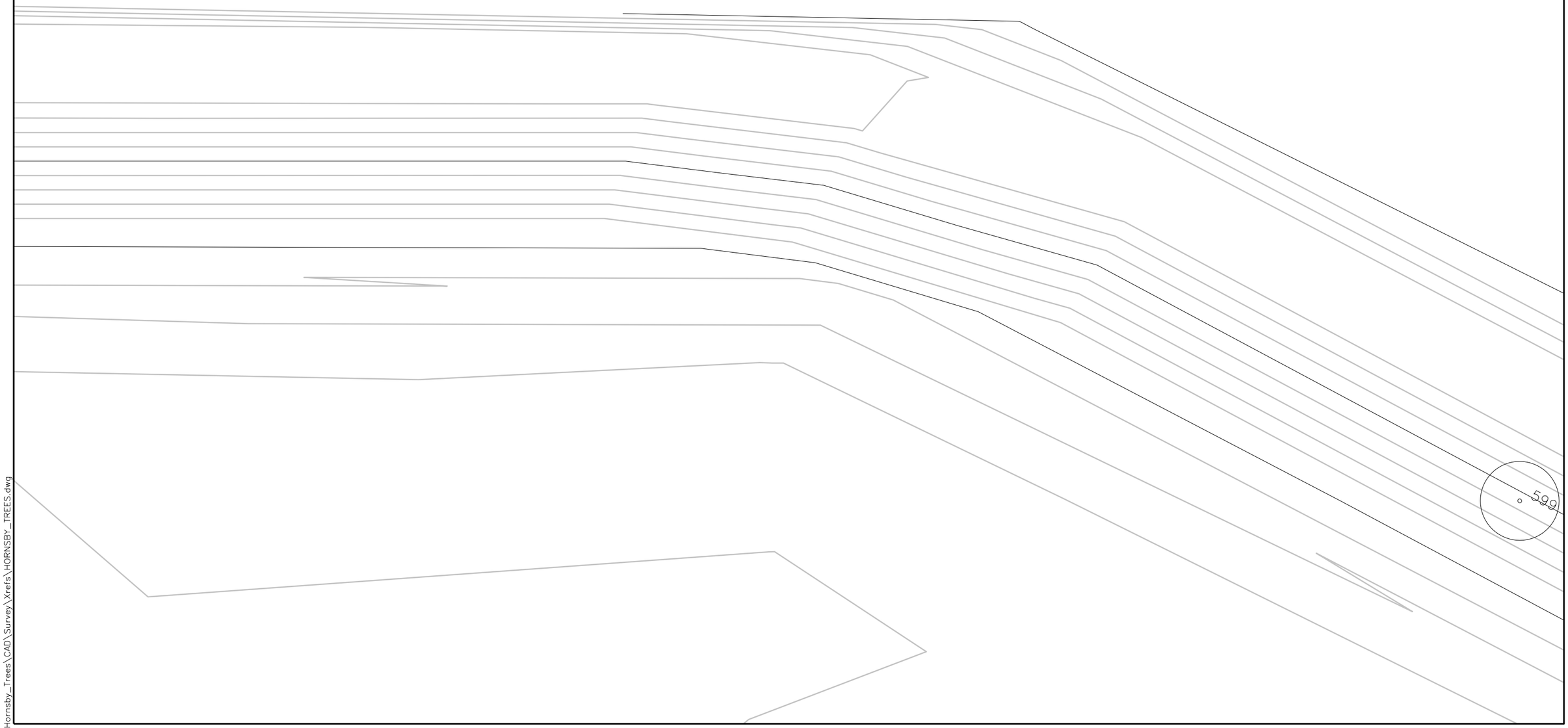
4

4 OF 30

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE



File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

5

5 OF 30

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

599

600

601

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

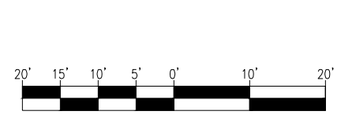
0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

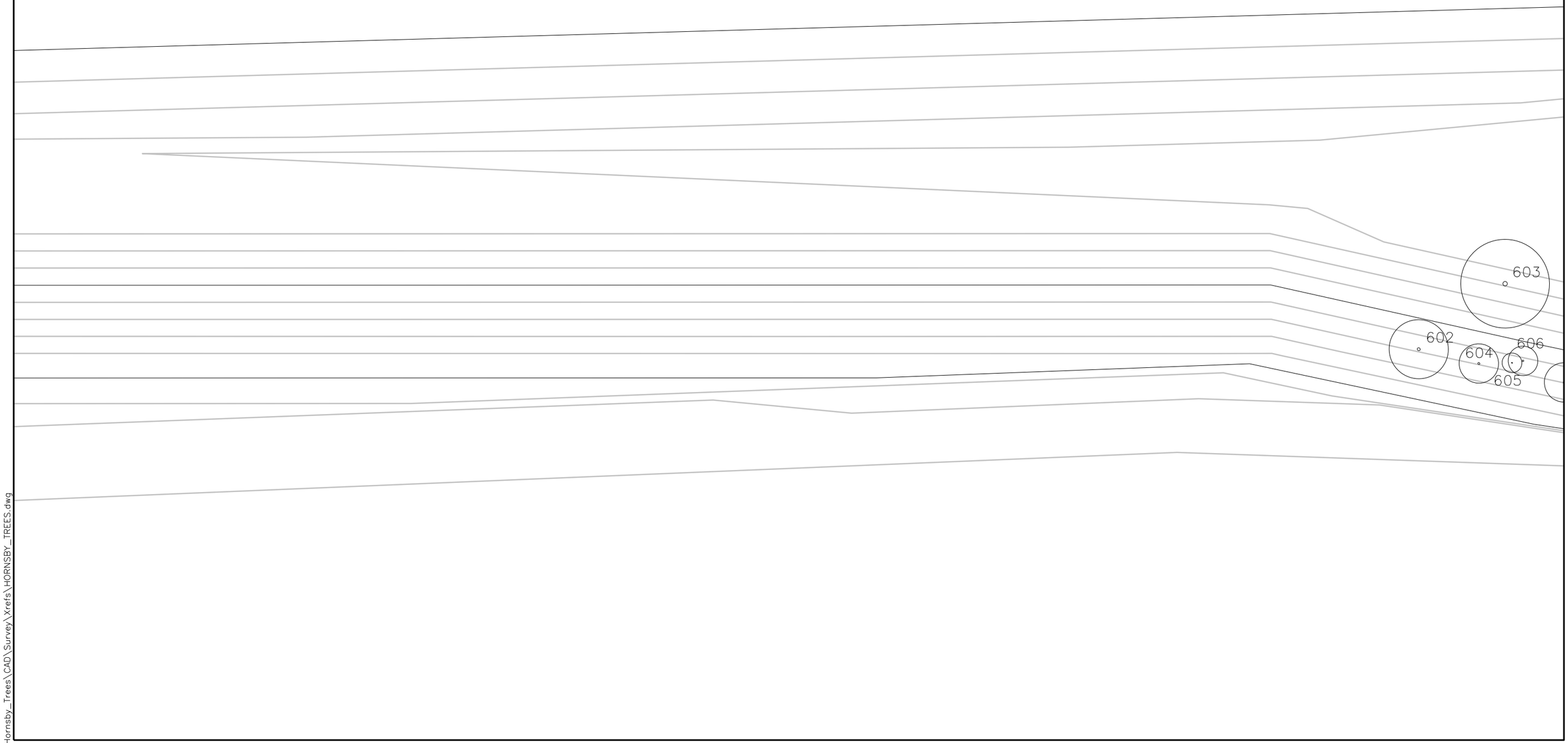
HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE



GRAPHIC SCALE



File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

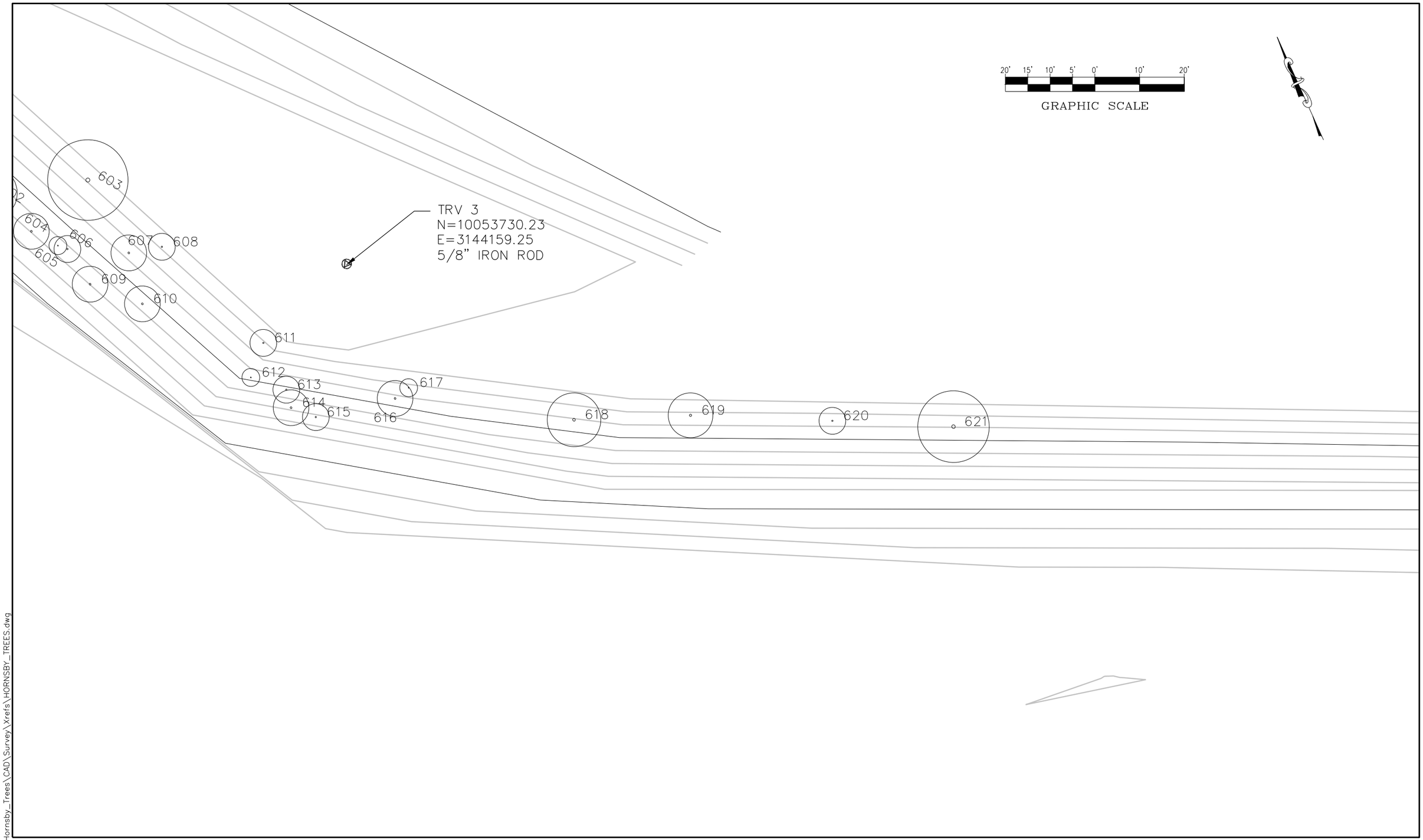
HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

7

7 OF 30



File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

556 555

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

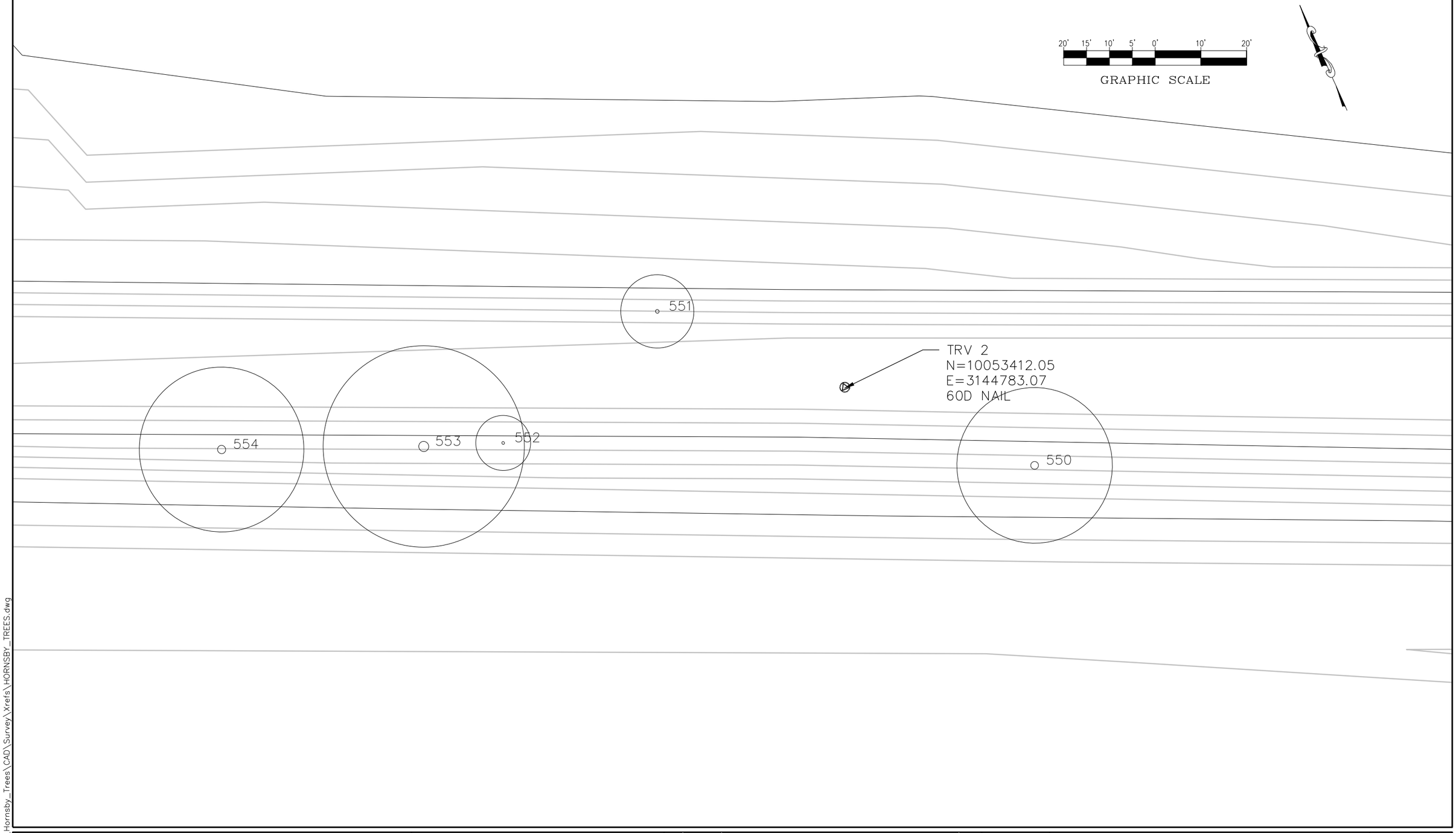
0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE



mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

549

548

547

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

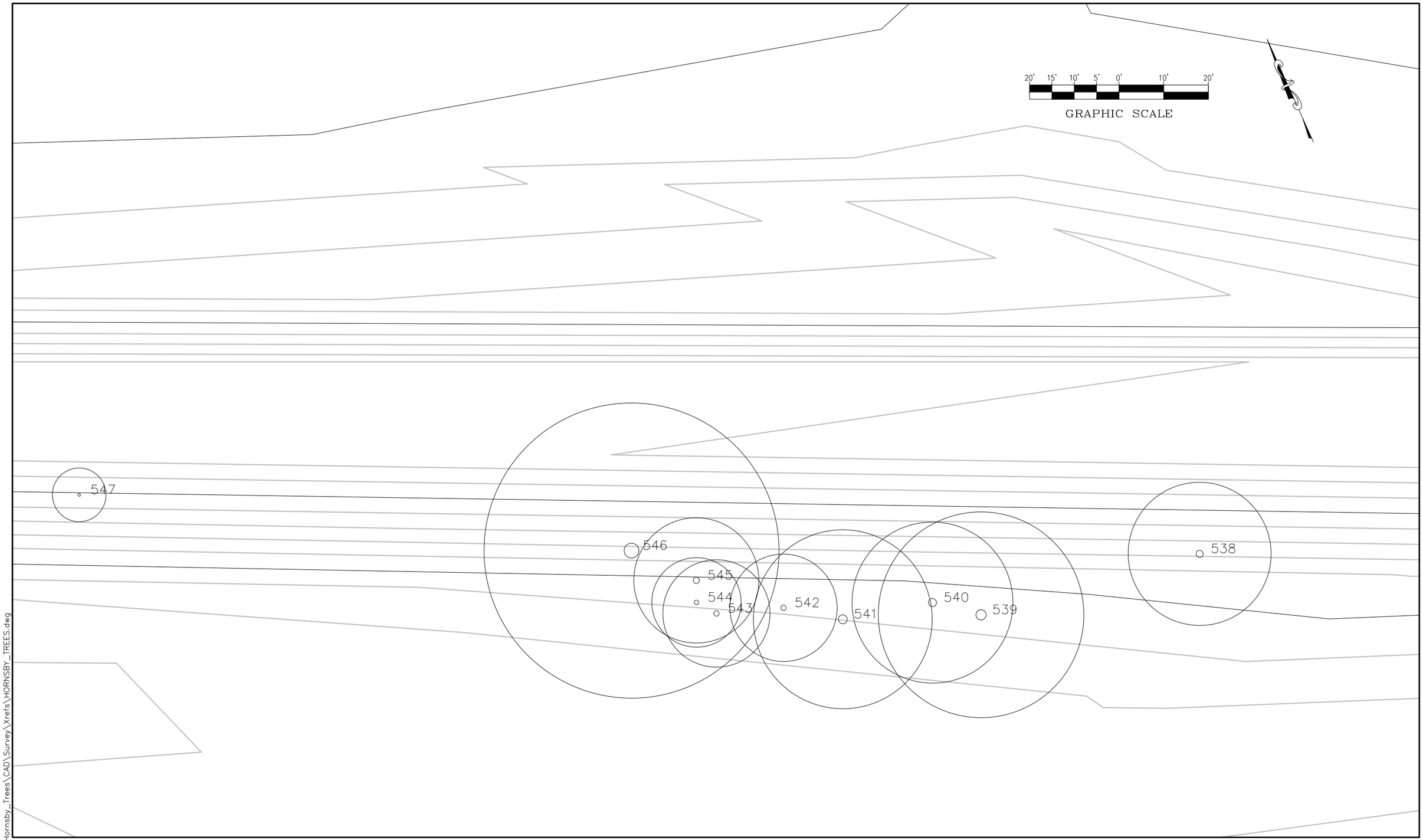
The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

11



mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

12

12 OF 30

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

536

537

535

531

529

530

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

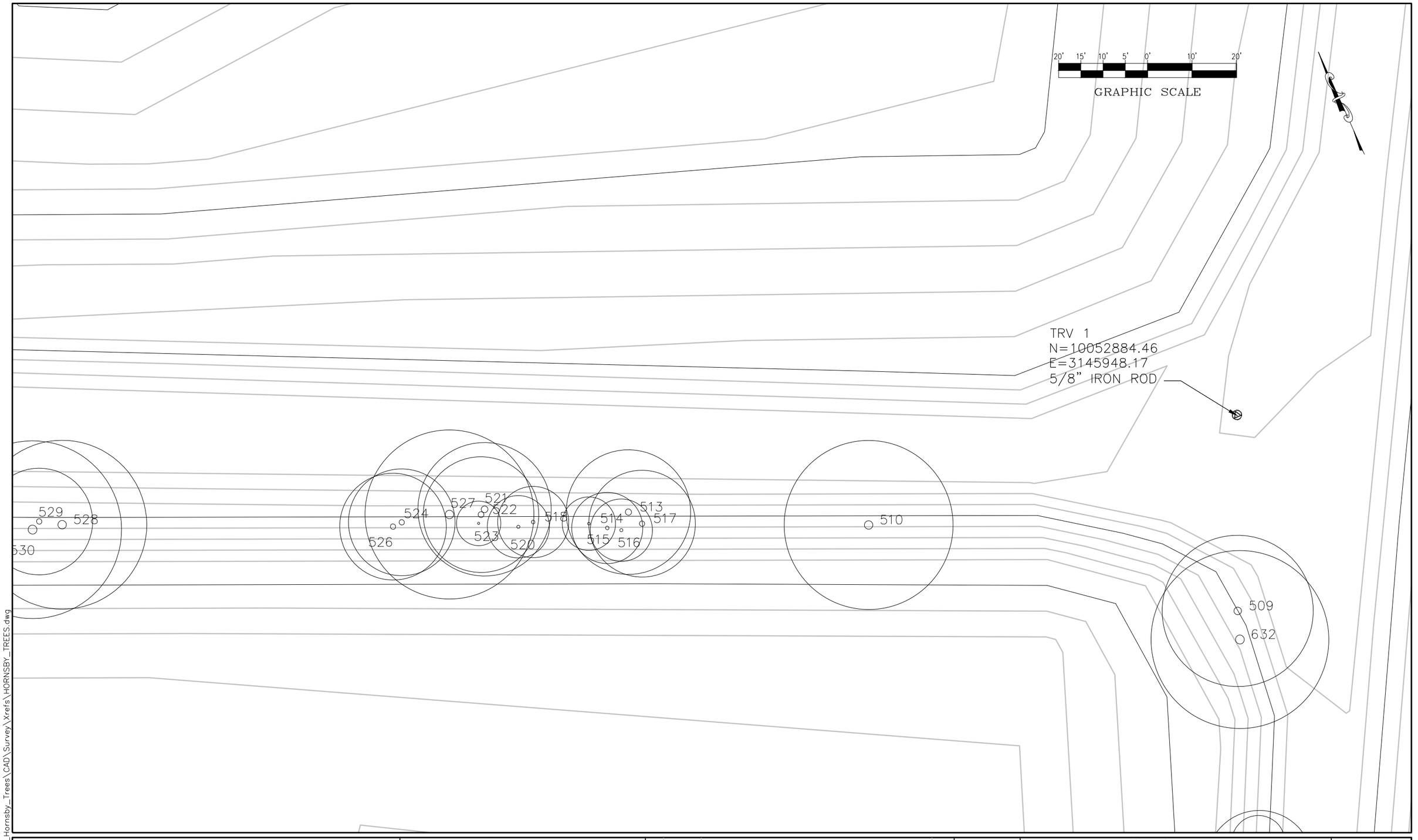
HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

13

13 OF 30



File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

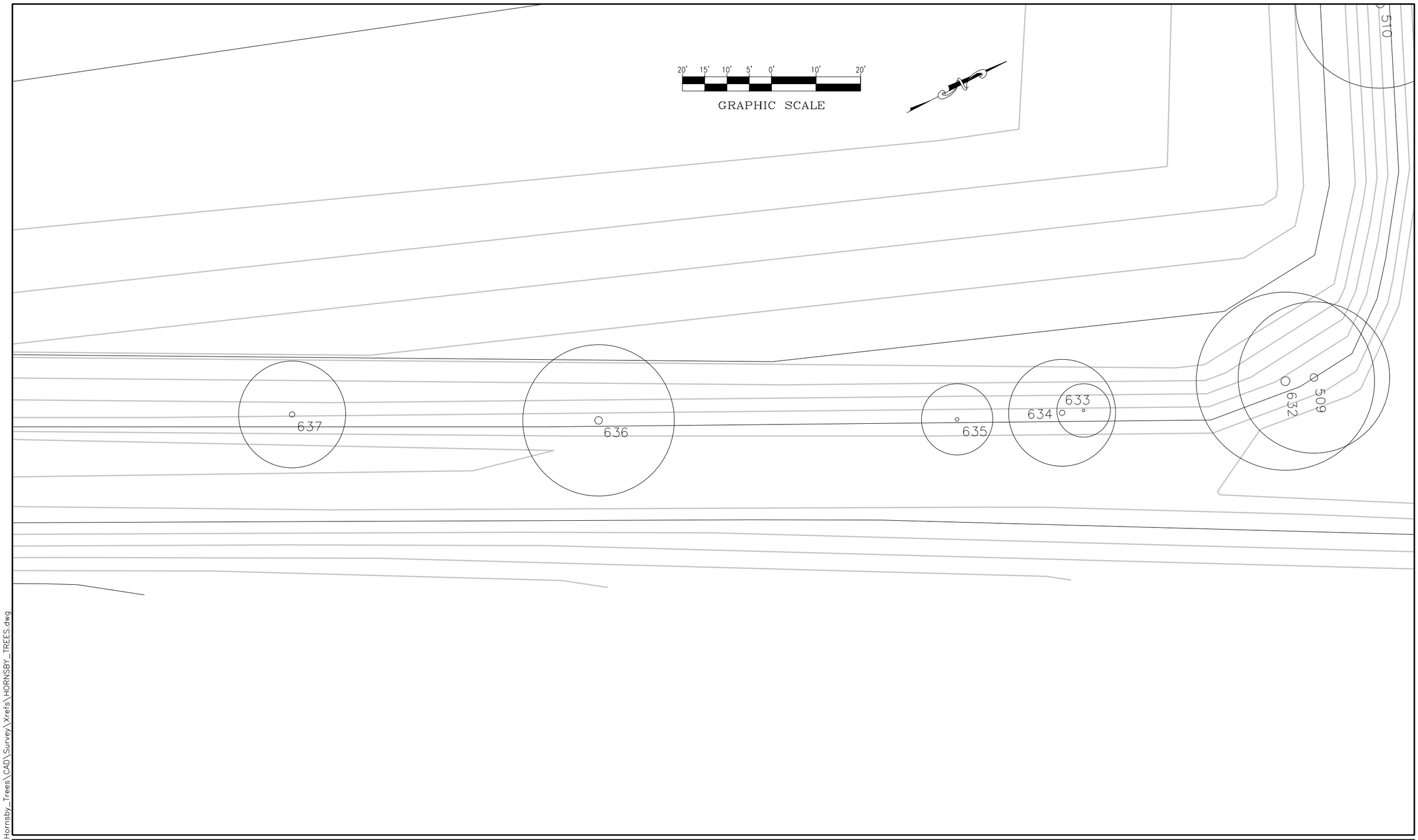
NO.	DATE	DESCRIPTION	BY

0 1/2"
The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE



mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

15

15 OF 30

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

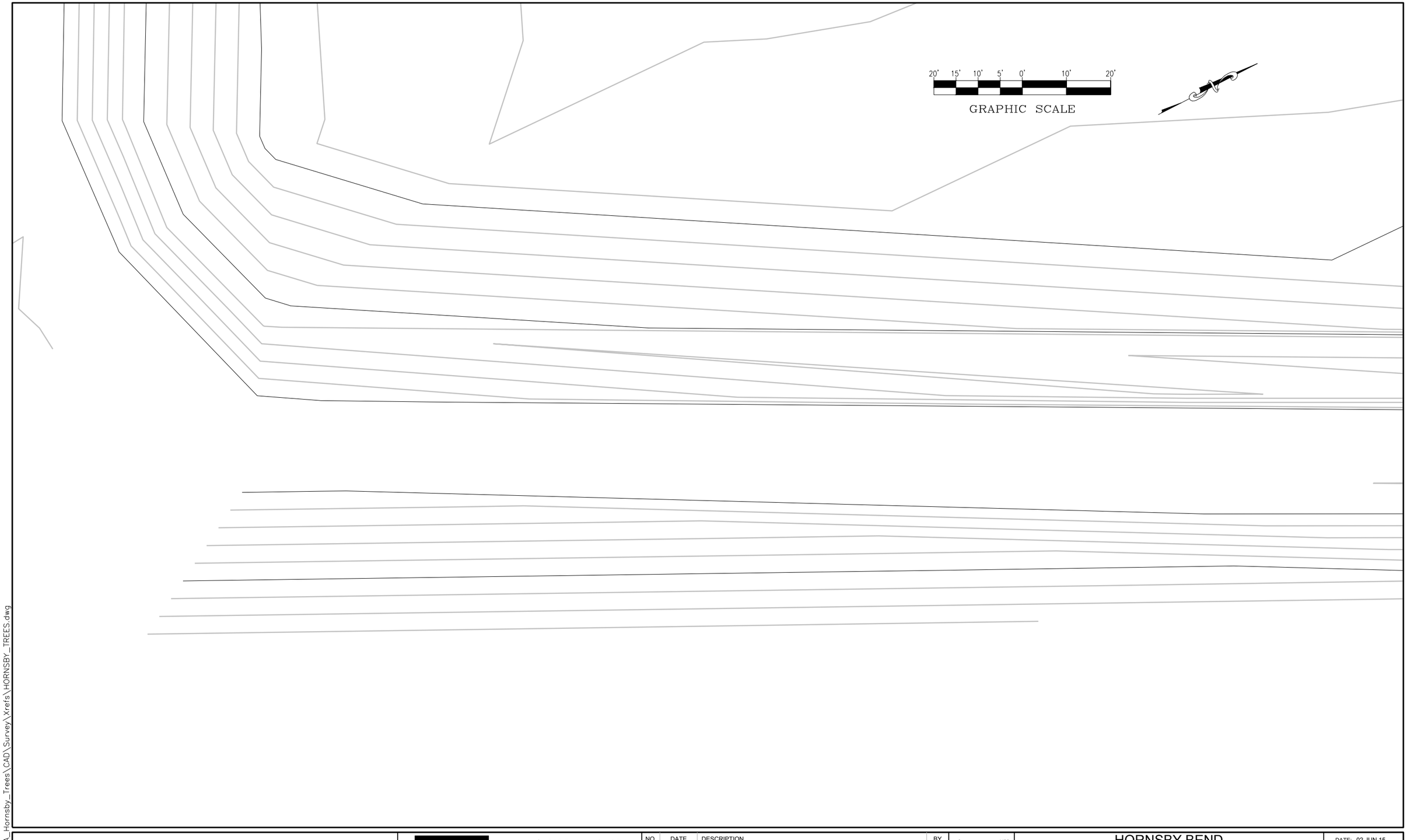
The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

16



mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

17

17 OF 30

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

566

567

mwm DesignGroup	305 East Huntland Drive Suite 200 Austin, Texas 78752 p: 512.453.0767 f: 512.453.1734 TBPLS Firm Registration No.: 10065600	NO. / DATE / DESCRIPTION / BY	0 1/2" The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

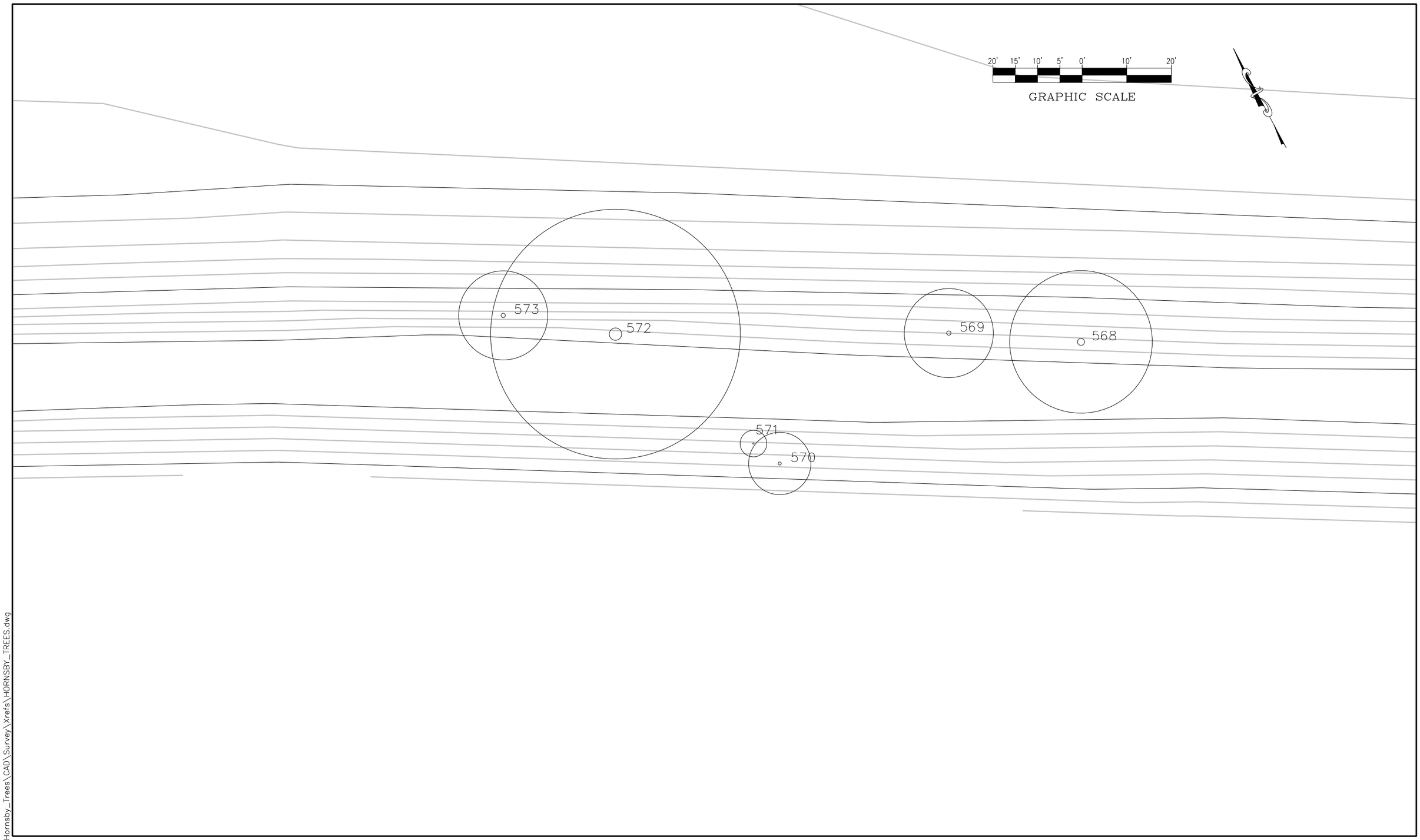
AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

18

18 OF 30

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg



mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

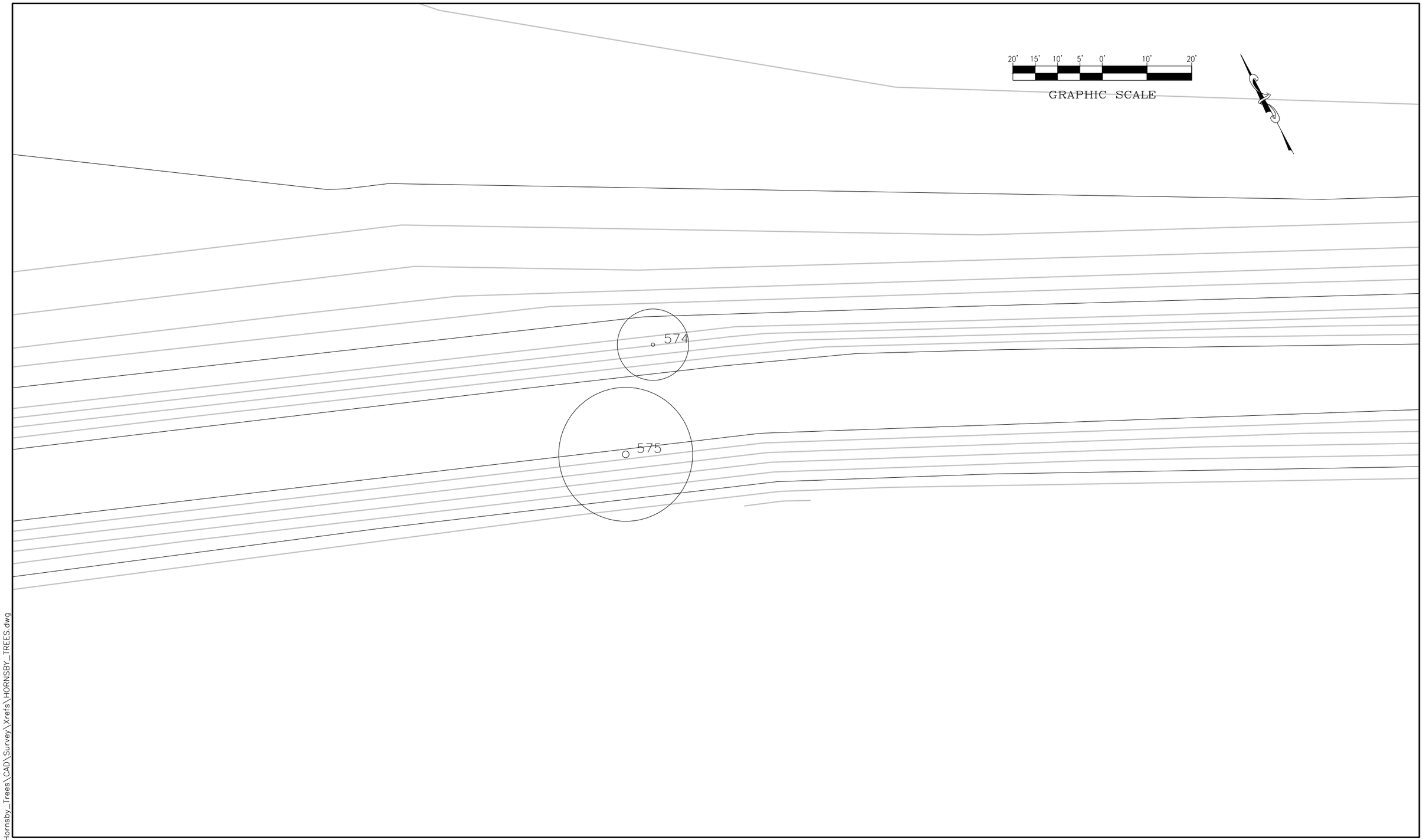
The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg



File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

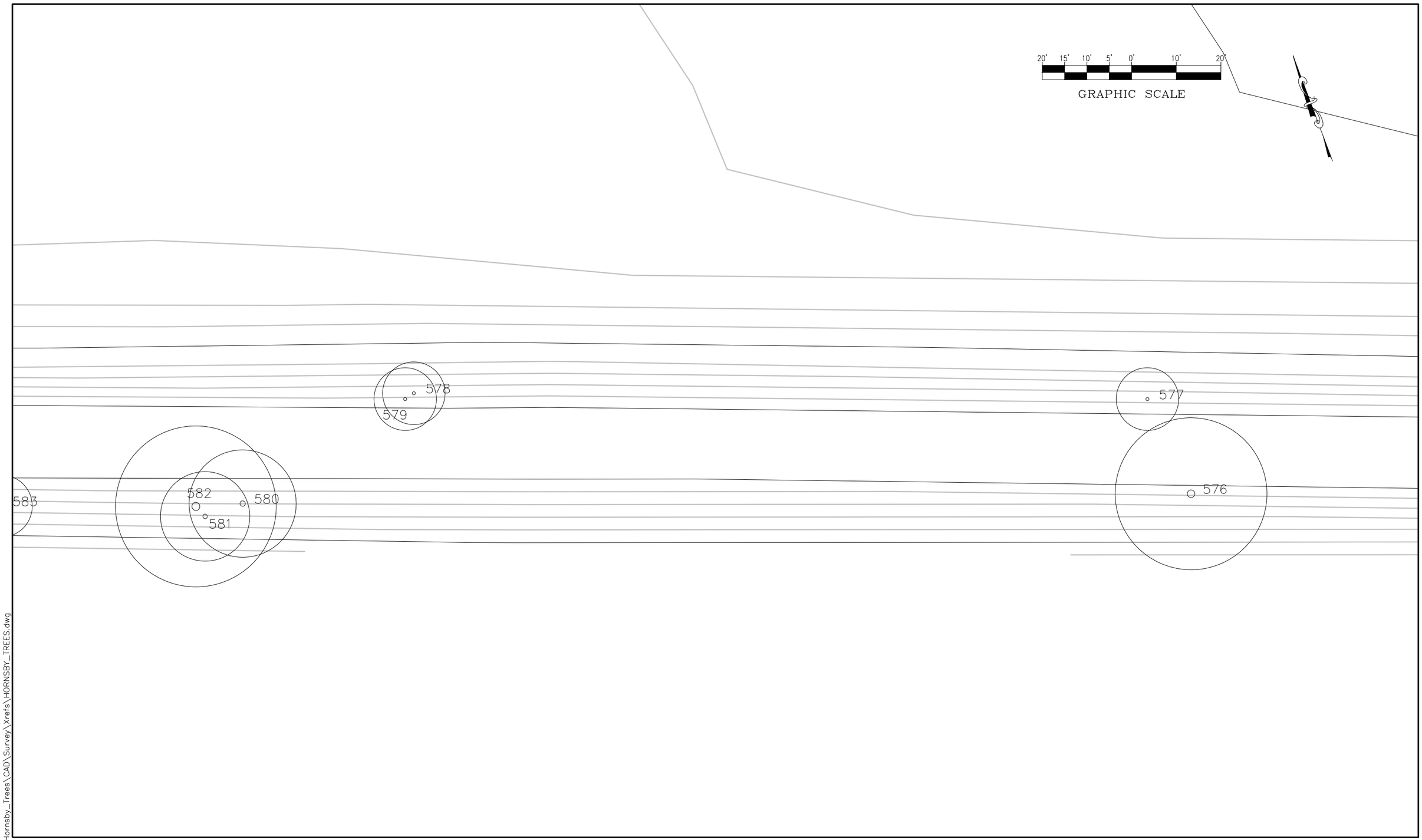
The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

20



File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

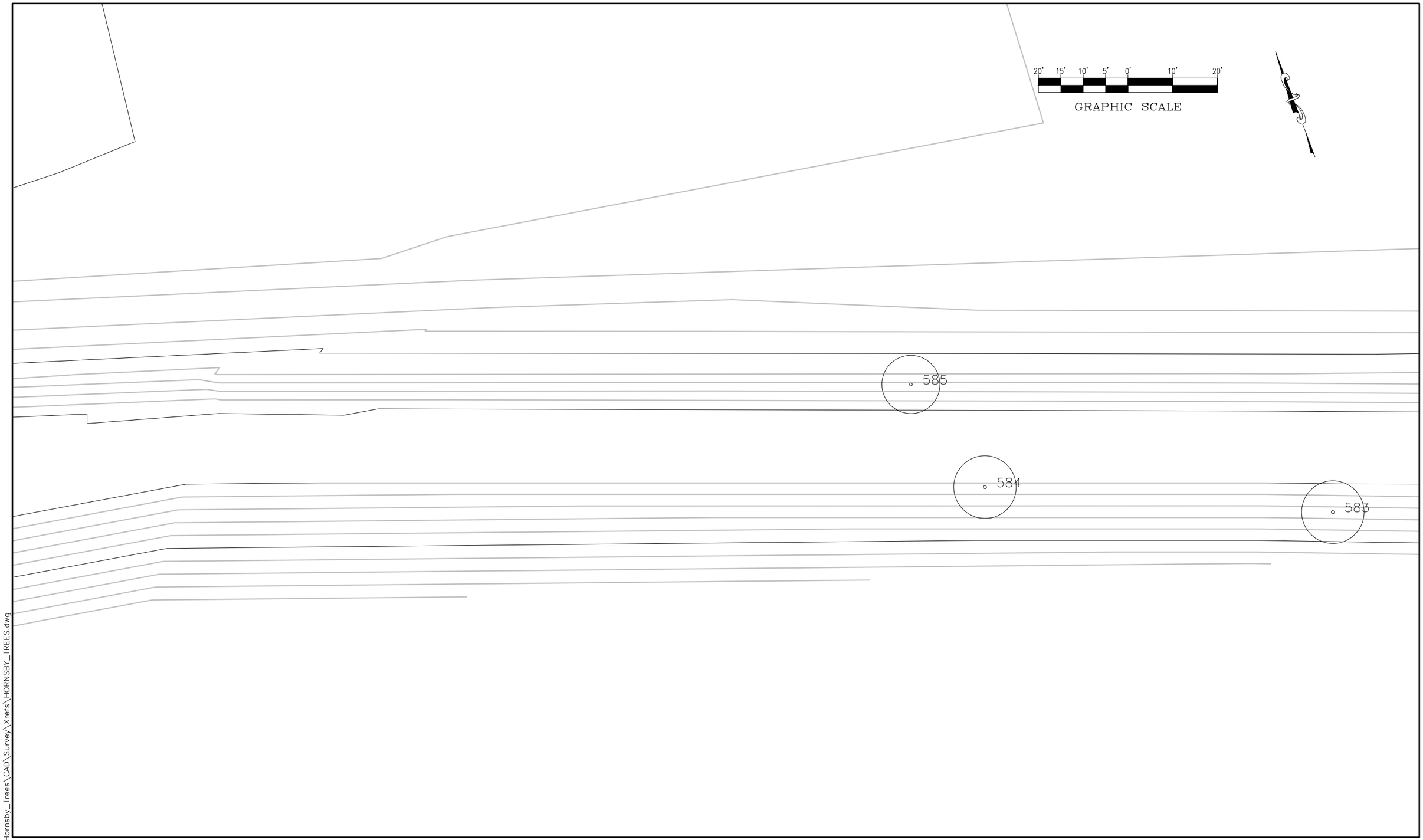
The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

21



mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

22

22 OF 30

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

587 586

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

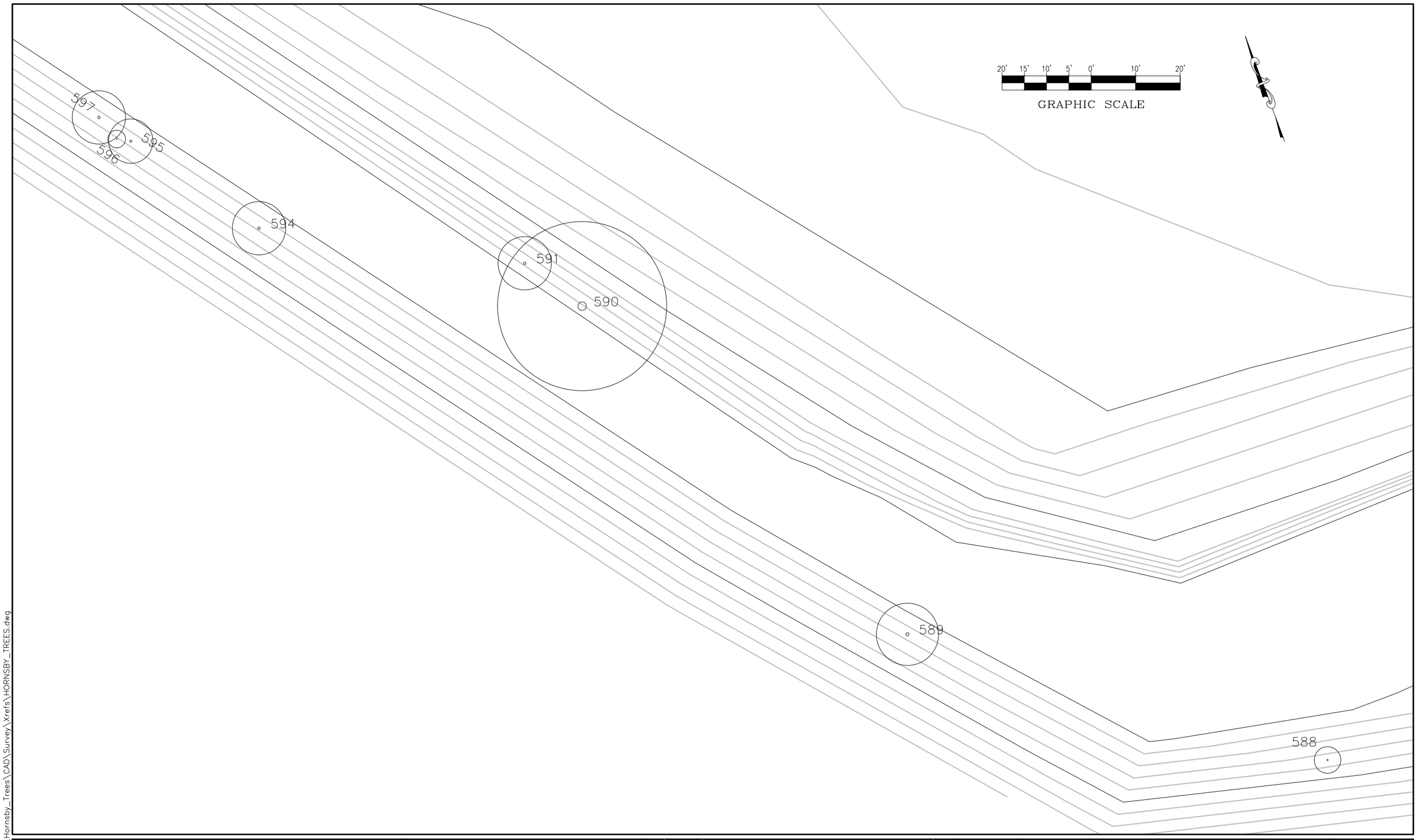
The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

23



mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

24

24 OF 30

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

598

597

595

596

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

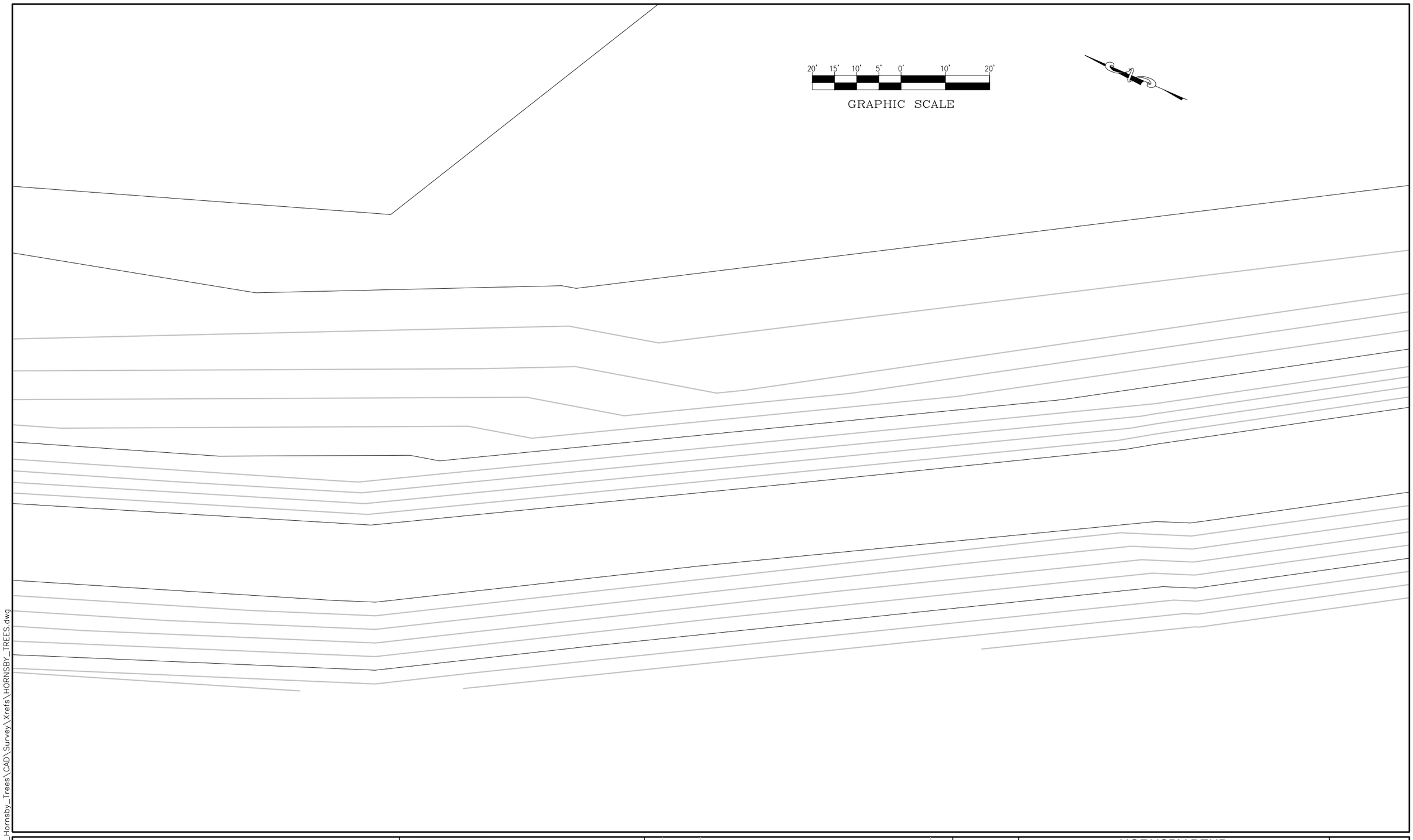
AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

26

26 OF 30

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg



File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup
305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

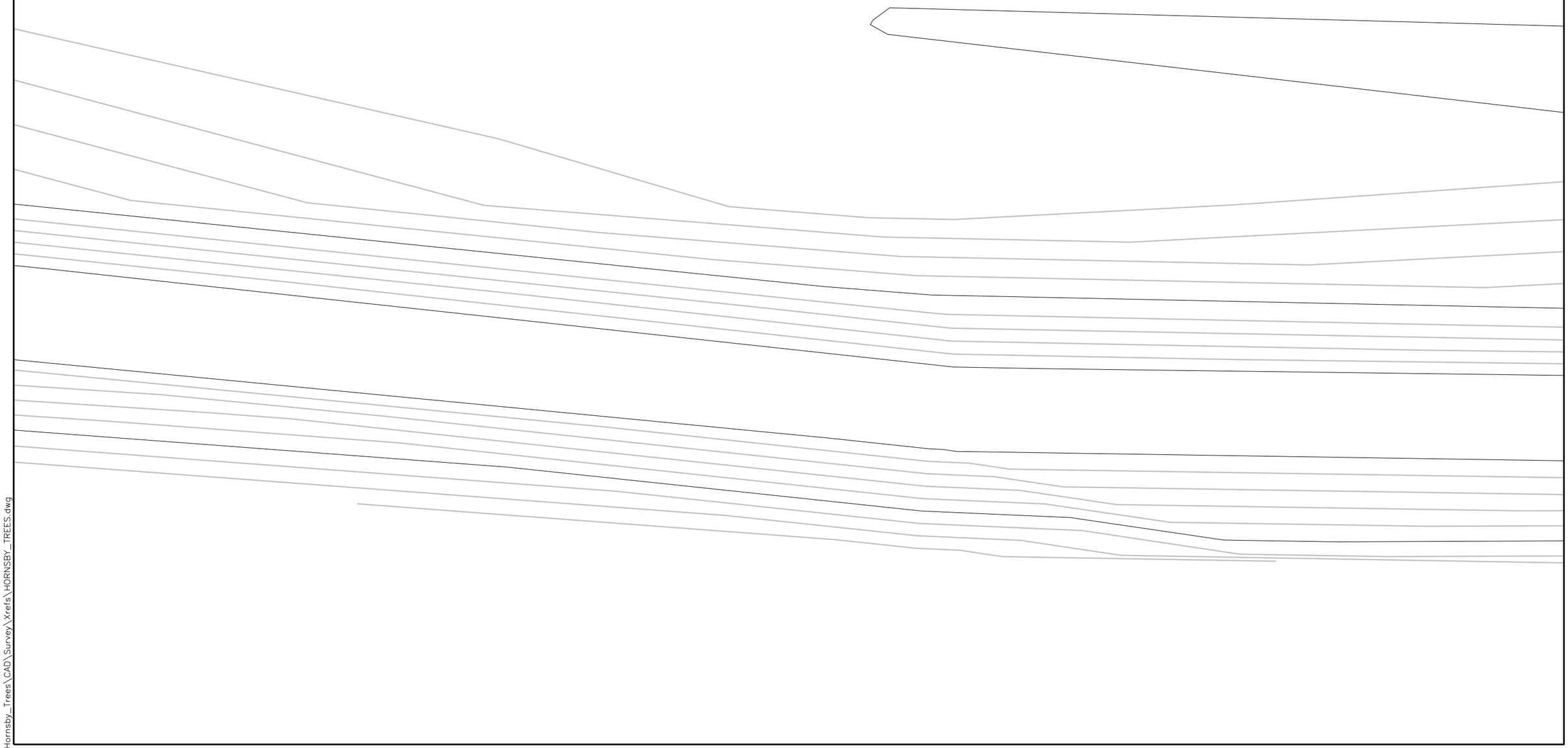
DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

27

27 OF 30

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE



File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

28

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

29

29 OF 30

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

20' 15' 10' 5' 0' 10' 20'

GRAPHIC SCALE

TRV 4
N=10054289.27
E=3142993.22
5/8" IRON ROD

File: Y:\089-12A_Hornsby_Trees\CAD\Survey\Xrefs\HORNSBY_TREES.dwg

mwm DesignGroup

305 East Huntland Drive
Suite 200
Austin, Texas 78752
p: 512.453.0767
f: 512.453.1734
TBPLS Firm Registration
No.: 10065600

NO.	DATE	DESCRIPTION	BY

0 1/2"

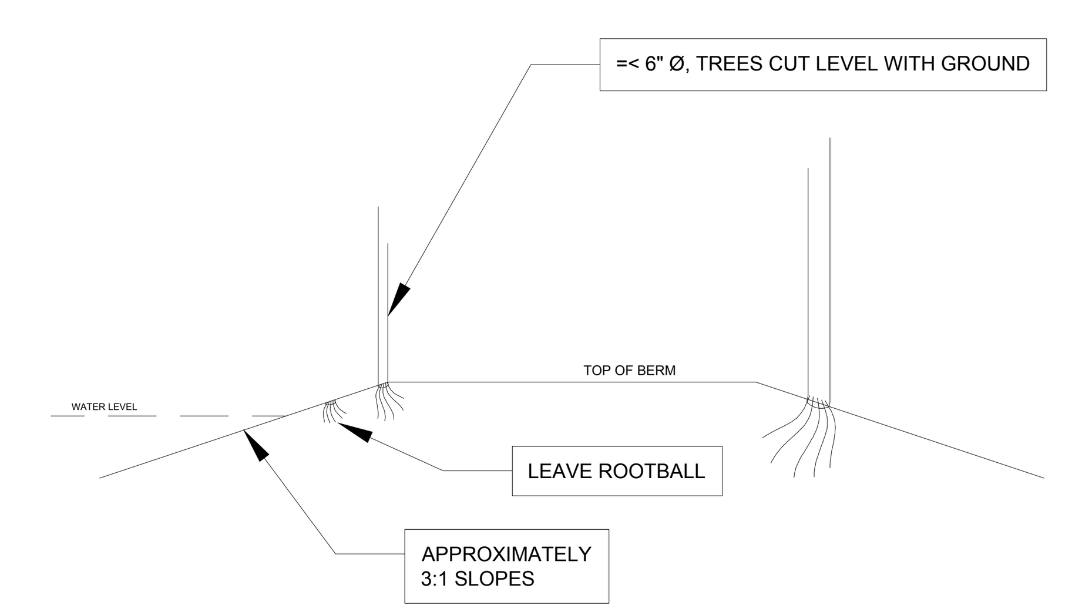
The bar above measures one-half inch on the original drawing. Adjust scales accordingly.

HORNSBY BEND
TREE MITIGATION SURVEY
TREE SURVEY

AUSTIN, TEXAS

DATE: 02 JUN 15
JOB NO: 089-12A
FILE: HORNSBY_TRE

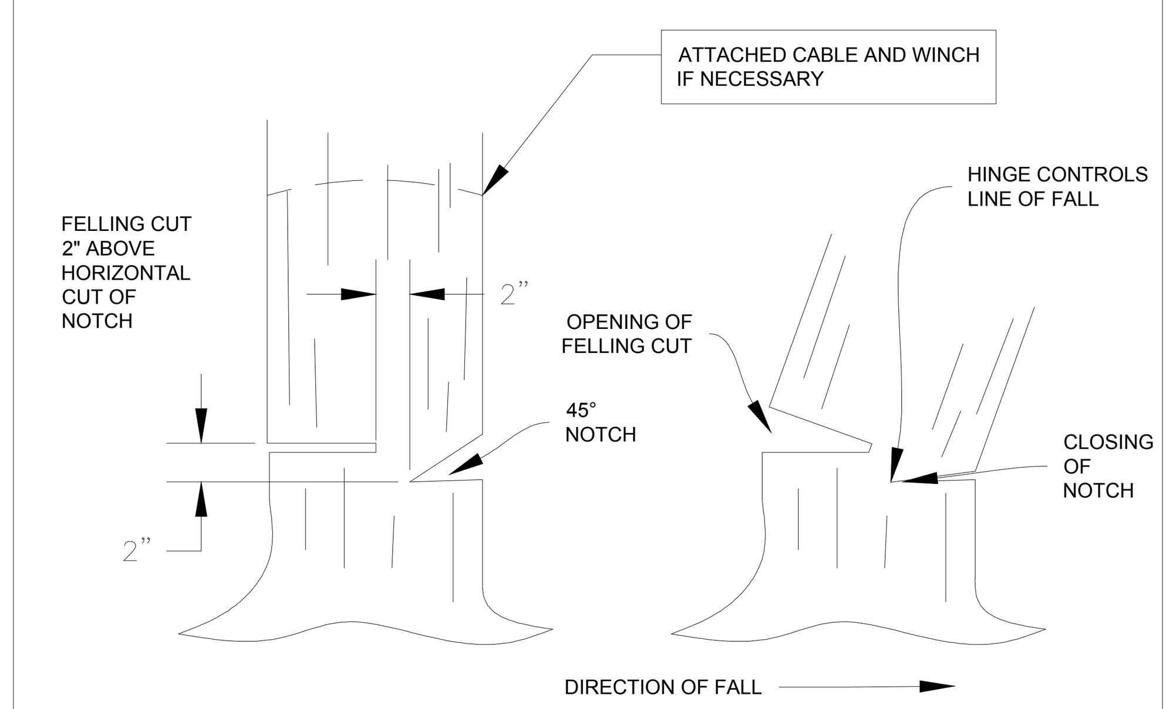
Appendix B:
Tree Removal Instructions and Example Details



NOTES:
1. THE STEMS OF TAGGED TREES THAT ARE EQUAL TO OR LESS THAN SIX (6) INCHES IN DBH WILL BE CUT FLUSH WITH THE GROUND.
2. AS THE TREES ARE CUT DOWN, THEY MUST FALL ON THE BERM AND NOT INTO THE WATER.
3. EACH STUMP WILL BE TREATED WITH GLYPHOSATE WITHIN 5 MINUTES OF CUTTING.
4. GLYPHOSATE WILL BE BRUSHED, WITH A DISPOSAL PAINT BRUSH, ONTO THE TOP OF THE STUMP.
5. GLYPHOSATE WILL BE APPLIED BY A LICENSED APPLICATOR.

INSTRUCTIONS ON SMALL TREE REMOVAL

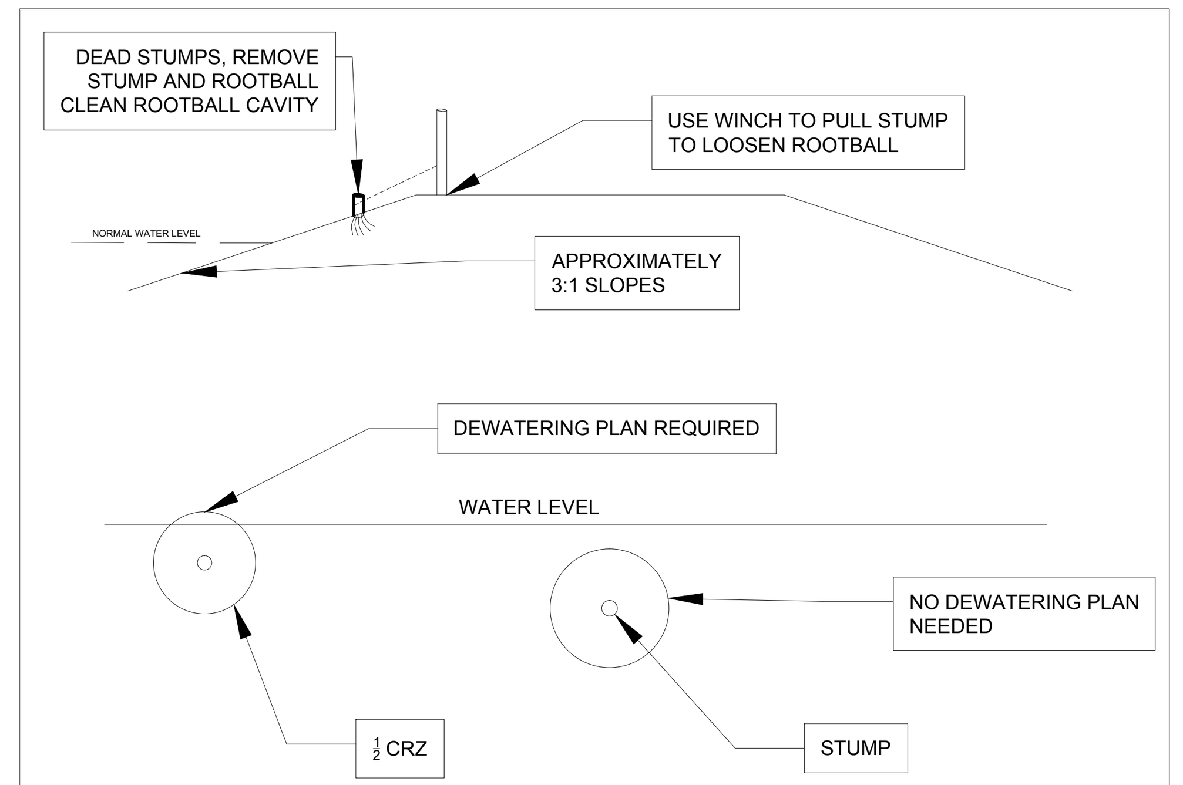
ADDITIONAL INFORMATION PROVIDED IN SECTION 4.0 OF TREE REMOVAL PLAN



NOTES:
1. ENTIRE TREE WILL FALL ON THE EARTHEN BERMS.
2. USE DIRECTIONAL FELLING TO CONTROL LOCATION OF FELLING AND WINCH, IF NECESSARY.

INSTRUCTIONS ON FELLING TREES

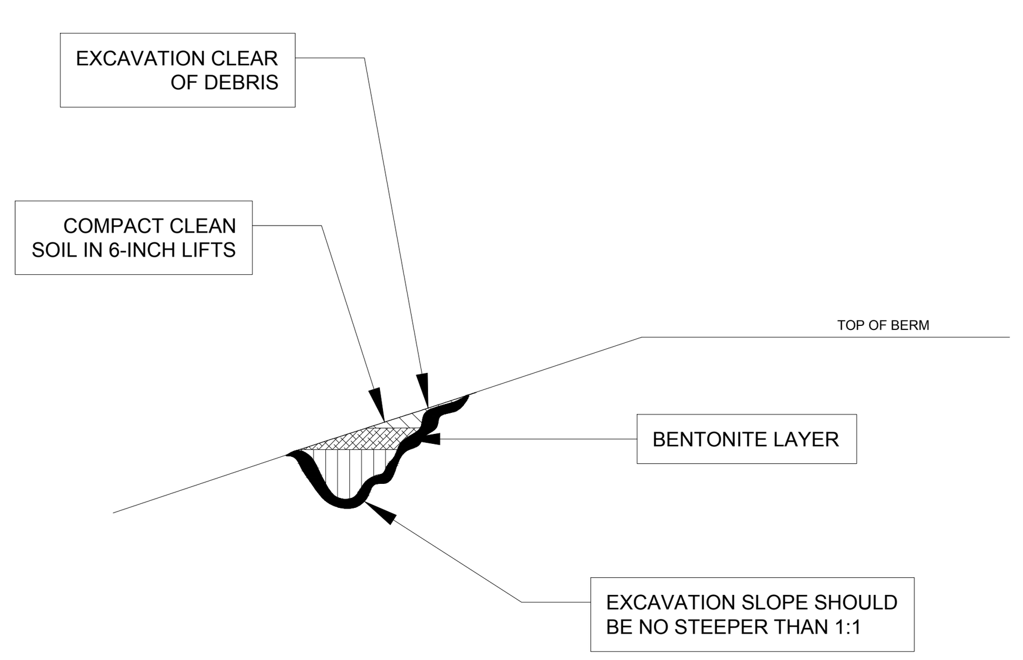
ADDITIONAL INFORMATION PROVIDED IN SECTION 6.1 OF TREE REMOVAL PLAN



NOTES:
1. DEWATER STUMPS THAT ARE LESS THAN ½ THEIR CRITICAL ROOT ZONE (CRZ) FROM WATER'S EDGE
2. USE HAND TOOLS TO DIG AROUND BASE OF THE STUMP TO EXPOSE ROOTBALL
3. USE WINCH TO PULL STUMP TO LOOSEN ROOTBALL
4. CONTINUE TO DIG AROUND ROOTBALL, REPEAT UNTIL STUMP IS REMOVED
5. GRUB OUT ANY REMAINING ROOTS LARGER THAN 2-INCH IN DIAMETER.

INSTRUCTIONS ON STUMP REMOVAL

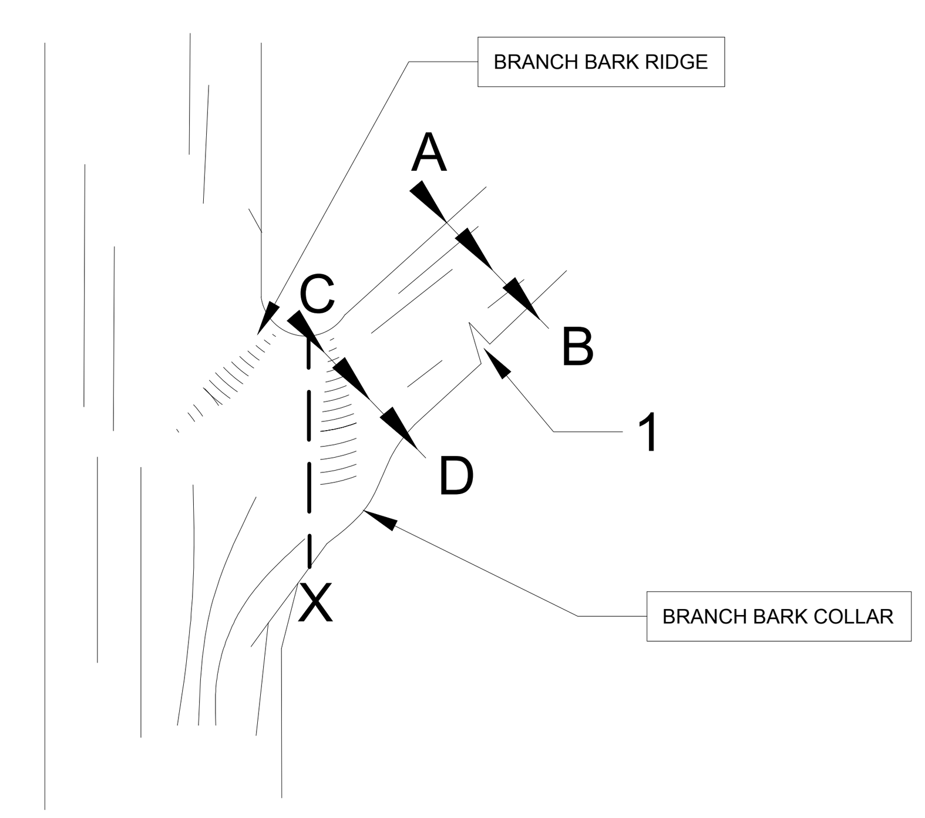
ADDITIONAL INFORMATION PROVIDED IN SECTION 6.2.3 OF TREE REMOVAL PLAN



NOTES:
1. CLEAR EXCAVATION OF LOOSE SOIL
2. LAYER BENTONITE CLAY ALONG BOTTOM AND SIDES OF EXCAVATION
3. BACKFILL EXCAVATION IN 6-INCH LIFTS OF NATIVE SOIL, COMPLY WITH SPECIFICATION 601S
4. COMPACT EACH 6-INCH LIFT USING COMPACTION EQUIPMENT
5. GRADE TO BLEND WITH SURROUNDING CONTOURS
6. SEED FOLLOWING SPECIFICATION 604S

INSTRUCTIONS ON BERM REPAIR

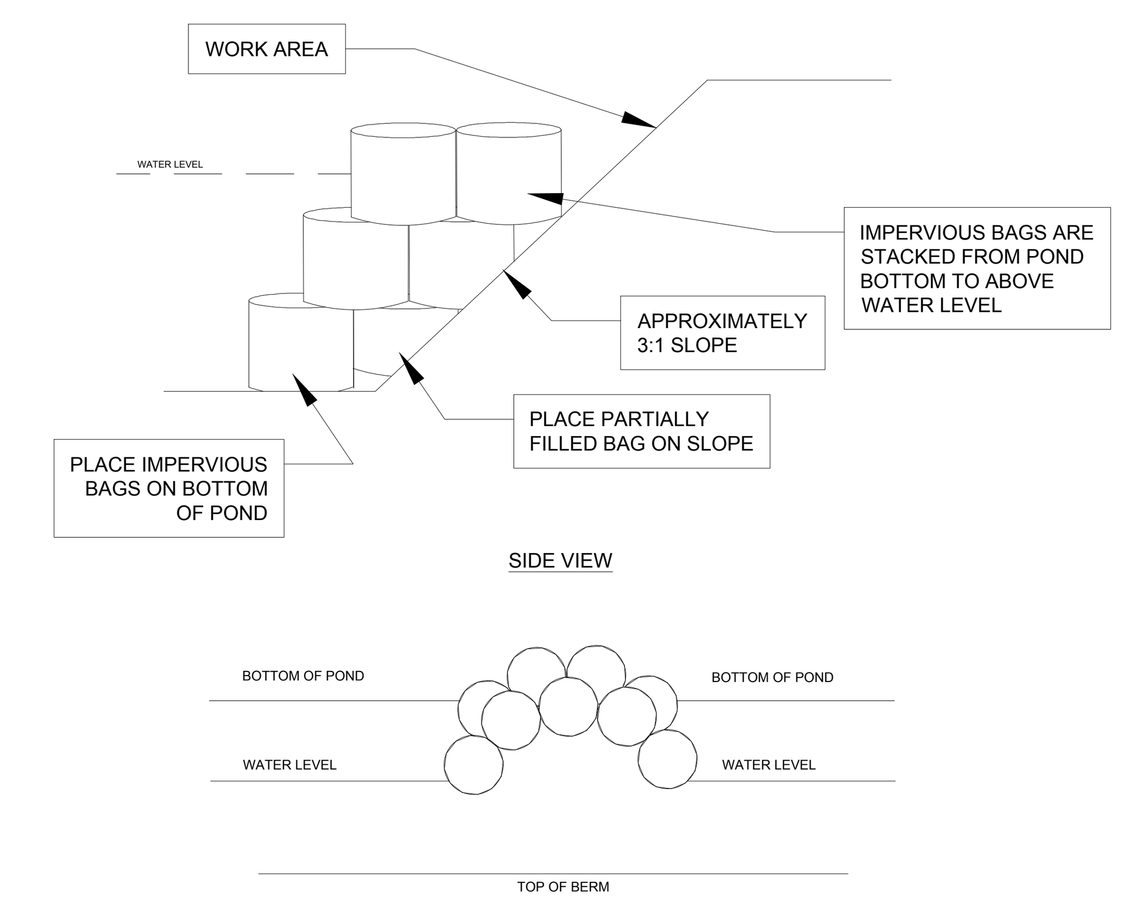
ADDITIONAL INFORMATION PROVIDED IN SECTION 6.3 OF TREE REMOVAL PLAN



NOTES:
1. FIRST CUT NOTCH AT 1
2. SECOND CUT, FROM A TO B
3. THIRD CUT, FROM C TO D
4. DO NOT CUT ALONG C-X

INSTRUCTIONS ON PRUNING DAMAGED TREES

ADDITIONAL INFORMATION PROVIDED IN SECTION 8.0 OF TREE REMOVAL PLAN



NOTES:
1. FILL IMPERVIOUS BAGS WITH GRAVEL OR SAND.
2. PLACE BAG ON BOTTOM OF POND (FLAT SURFACE)
3. STACK BAGS FROM BOTTOM OF POND TO ABOVE WATER LEVEL
4. USE PARTIALLY FILLED BAGS ON SLOPE
5. USE PUMP TO PUMP WATER OUT OF WORK AREA
6. DO NOT USE ANCHORS OR OTHER OBJECTS THAT WOULD PIERCE THE POND OR LINER OR BERM.

INSTRUCTIONS FOR AN EXAMPLE DEWATERING PLAN

ADDITIONAL INFORMATION PROVIDED IN SECTION 6.2.2 OF TREE REMOVAL PLAN

REV	DESCRIPTION	DATE	APR

REV	DESCRIPTION	DATE	APR

DESIGNED BY J. LUECKEMEYER
REVIEWED BY: T. BAER
FILE NAME: COA TREE RMV DTL.DWG
PLOT DATE: June 2015
DRAWING SCALE: AS NOTED

DRAWN BY: L. HAXTON
CHECKED BY: J. LUECKEMEYER

CITY OF AUSTIN PUBLIC WORKS DEPARTMENT

Baer Engineering and Environmental Consulting, Inc.

HORNSBY BEND BIOSOLIDS MANAGMENT PLANT TREE REMOVAL PLAN

TREE REMOVAL INSTRUCTIONS AND DETAIL EXAMPLES

SHEET REFERENCE NUMBER
CE-001
SHEET XX OF XX

90% SUBMITTAL

E:\Hornsby\COA TREE RMV DTL.dwg Layout: 001 Plotted: 6/18/2015 1:32:38 PM

Appendix C: Contractor Data Sheets

Dates:	**Contractor Name:**		
Personnel Names:			
Tree Tag:	**Action:** (Felled, Painted, Excavated, Pruned)	**Dewatering Required?**	**Comments**
509			
510			
513			
514			
515			
516			
517			
518			
520			
521			
522			
523			
524			
526			
527			
528			
527			
528			
529			
530			
531			
535			
536			
537			
538			
539			
540			
541			
542			
543			
544			
545			
546			
547			
548			

Dates:	**Contractor Name:**		
Personnel Names:			
Tree Tag:	**Action:** (Felled, Painted, Excavated, Pruned)	**Dewatering Required?**	**Comments**
546			
547			
548			
549			
550			
551			
552			
553			
554			
555			
556			
566			
567			
568			
569			
570			
571			
572			
573			
574			
575			
576			
577			
578			
579			
580			
581			
582			
583			
584			
585			
586			
587			
588			
589			

Dates:	**Contractor Name:**		
Personnel Names:			
Tree Tag:	**Action:** (Felled, Painted, Excavated, Pruned)	**Dewatering Required?**	**Comments**
590			
591			
594			
595			
596			
597			
598			
599			
600			
601			
602			
603			
604			
605			
606			
607			
608			
609			
610			
611			
612			
613			
614			
615			
616			
617			
618			
619			
620			
621			
632			
633			

Dates:	**Contractor Name:**		
Personnel Names:			
Tree Tag:	**Action:** (Felled, Painted, Excavated, Pruned)	**Dewatering Required?**	**Comments**
634			
635			
636			
637			