SECTION S626 - SURVEY MONUMENT

S626 GENERAL

As of start work date as established by Notice to Proceed is issued, protection of all survey monuments within limits of project site is responsibility of General Contractor.

If survey monument is found destroyed commencing on start work date, and party responsible for destroying survey monument is unclear or undeterminable, survey monument is to be replaced at Contractor's expense.

Prior to commencing construction, Contractor is responsible to contact City's Maps and Surveys office to verify that necessary ties have been taken for all survey monuments.

Survey monument issues that remain unresolved over 90 calendar days from date of discovery may result in declaration of contract default.

In case of utility Contractor(s), permits for proposed utility work may be withheld until any outstanding survey monument issues have been resolved.

New or replacement horizontal control survey monument is to have monument line intersection physically defined with mark appropriate to type of survey monument being installed.

S626-1 DESCRIPTION

Work consists of installation of new survey monument; adjustment, abandonment or removal of existing survey monument; installation of new and resetting of existing survey monument frame and cover; related survey work, preparation and submittal of survey data and survey monument certification; as required in Contract Documents, and as directed by City's Maps and Surveys office and Project Manager.

References to NYSDOT specifications are to be in accordance with latest edition of *NYSDOT Standard Specifications (US Customary Units)*.

S626-2 MATERIALS

S626-2.01 Horizontal Control Survey Monument (RCS)

Horizontal control survey monument is to be granite and come from approved quarries.

Granite is to be light colored, sound and durable, free from seams which impair its structural integrity and of smooth splitting and machining character. Granite is to be rough quarried to required dimensions, with top having smooth finish. Quarrying holes are not permitted in top of granite.

S626-2.02 Vertical Control Survey Monument (RTS)

Vertical control survey monument is to be constructed of Class K concrete, with number 5 (5/8 inch) rebar set in center of and running for full length of concrete survey monument.

Rebar is to be grade 60 in accordance with NYSDOT Section 709-01 Bar Reinforcement, Grade 60.

If used, rebar cap is to be brass 2 inch diameter domed cap with plastic insert in accordance with SKB-108-2D as manufactured by Surv-Kap, or approved equivalent.

S626-2.03 Survey Monument Frame and Cover

Survey monument frame and cover castings are to be cast iron, with letters RCS cast into top of cover, per standard detail, or approved equivalent. Equivalent frame and cover castings may be used only with prior written approval by Maps and Surveys office. Upon request, dimensional requirements will be provided by Maps and Surveys office.

Heavy-duty survey monument frame and cover castings to be in accordance with EJ #4178A and #4178Z as manufactured by EJ Group, or approved equivalent.

S626-2.04 Brass Disc Survey Marker (RCS) - Furnished

Brass disc survey marker will be as furnished by Maps and Surveys office. Contractor is to pick up and sign for brass disc survey marker during normal business hours from Maps and Surveys office, City Hall Room 225B, 30 Church Street, Rochester, New York, Monday through Friday, between hours of 8:00AM and 2:00PM, (585) 428-6873. Maps and Surveys office requires minimum of 2 working days advance notice to make arrangements for pickup of furnished materials.

S626-2.05 Backfill

Backfill is to be select granular fill is to be in accordance with NYSDOT Section 203 Excavation and Embankment.

Recycled materials, pulverized or recycled portland cement concrete aggregate (RCA) and brick, reclaimed asphalt pavement (RAP), and Corian® are unacceptable for use as backfill material, unless specifically authorized in writing by City Engineer.

S626-2.06 Concrete

Concrete is to be Class K in accordance with Section S504 Portland Cement Concrete.

S626-2.07 Grout

Grout is to be non-shrink type grout with minimum compressive strength of 4000 psi at 24 hours in accordance with NYSDOT Section 701-05 Concrete Grouting and Anchoring Material.

S626-3 CONSTRUCTION DETAILS

S626-3.01 General

New survey monument is to be set under direction of Land Surveyor licensed to practice in State of New York.

Special attention is directed to Section 104-22 of Municipal Code of City of Rochester regarding requirements for permit when working in vicinity of survey monument, as reiterated herein:

> *Section 104-22. Interference with survey monuments.*
>
> > *No person shall interfere with, disturb or move any survey monument without having obtained a permit in writing from the City Engineer. Interference for the purpose of this section shall be defined as any excavation work within three feet of a survey monument or any extensive excavation work further than three feet from a survey monument that may affect the accuracy of the monument.*

Required data for survey monument certification submittal is to be prepared by NYS Licensed Land Surveyor and provided to Project Manager for delivery to, review and approval of Maps and Surveys office. Data for survey monument certification submittal and certification card is to be provided in accordance with Section S626-4 Survey Monument - Survey, Submittal and Certification Requirements. Submittal of either horizontal (RCS) or vertical (RTS) monument certification data to Maps and Surveys office does not constitute acceptance of survey monument. Written acceptance or rejection of each survey monument will be made by Maps and Surveys office after review of submitted data and certification card.

New survey monument is to be installed complete with frame and cover.

Top of survey monument is not to be less than 4 inches nor more than 6 inches below finished grade (except for brass disc survey markers).

Rebar in vertical control survey monument structure is to be either topped with 2 inch diameter domed cap with plastic insert and tapered internal hole capable of accommodating ends of irregular shaped rebar; or rounded at top and extend 1/2 to 1 inch above top of concrete survey monument.

Balance of excavation to be backfilled with select granular fill compacted in 6 inch layers.

To make arrangements for pickup of salvaged materials, notify Maps and Surveys office between hours of 8:00AM and 2:00PM, Monday thru Friday, at (585) 428-6873.

S626-3.02 Destroyed Survey Monument

Survey monument that is found to be destroyed commencing on date to start work, and responsible party is unclear or cannot be determined, or in event that survey monument is destroyed due to construction operations, destroyed survey monument is to be replaced at Contractor's expense with new survey monument of same type as one destroyed.

Destroyed survey monument is one that has been:

- moved more than 0.02 of foot in any direction from its City tied position; or
- broken; or
- disturbed to point that survey monument's position is no longer fixed or stable; or
- excavated and removed from ground for any reason; or
- vertically adjusted without prior written authorization of Maps and Surveys office

Horizontal control survey monument theoretical position of intersection of two monument lines is to be marked with drill hole on granite survey monument, or punch mark and cross on brass disc survey marker.

Elevation of new vertical control survey monument is to be established.

S626-3.03 New Survey Monument

For purposes of this specification, new survey monument is defined as survey monument designated by Maps and Surveys office to be set, excluding those new survey monuments which are to be set to replace any destroyed survey monument.

New survey monument is to be installed complete with frame and cover.

New survey monument installations include:

- survey monument set to upgrade monument network density
- survey monument set to replace existing survey monument in poor physical condition
- survey monument set within new street to be accepted by City and dedicated as public right-of-way

Rochester City Survey Monument (RCS) - RCS survey monument is for horizontal control set to define limits of street right-of-way as shown on City of Rochester's official mapping. RCS survey monument is typically set and marked at intersection of two monument lines, said monument lines being parallel to and 4.00 feet offset into right-of-way from street property (right-of-way) lines.

Rochester Topographic Survey Monument (RTS) - RTS survey monument is for vertical control set as permanent benchmark referenced to elevations in City of Rochester "City Datum".

S626-3.04 Horizontal Control Survey Monument (RCS) - Theoretical Position Marking

Horizontal control survey monument is to be placed and centered at theoretical position of intersection of two monument lines, said monument lines being parallel to and 4.00 feet offset into right-of-way from street property (right-of-way) lines, unless otherwise authorized in writing by Maps and Surveys office.

Theoretical position is to be marked on top of granite survey monument with 1/8 to 1/4 inch diameter drill hole minimum of 3/8 inch deep, and minimum of 1/2 inch from outer edge of monument stone.

Theoretical position is to be marked on top of brass disc survey marker with punch mark and cross.

S626-3.05 Vertical Adjustment of Existing Horizontal Control Survey Monument (RCS)

A. General

Vertical height adjustment of survey monument is to take place only at written direction of Maps and Surveys office. Vertical height adjustment that is performed without prior written authorization from Maps and Surveys office is to be considered destruction of survey monument, and require survey monument replacement and certification.

Vertical adjustment of vertical survey control monument is not allowed.

Top of existing survey monument is to be cut using power saw with diamond or abrasive blades designed for such work, and capable of saw cutting horizontally.

Carefully excavate for and remove survey monument frame and cover. Further excavate to sufficient depth to expose top of survey monument stone, saw cut top of survey monument full width of stone to required elevation and along neat, straight lines. Cut pieces are to be immediately removed and properly disposed of. Saw cut top is to be milled or ground finished to smooth level surface that is free from burrs, nicks, or other markings or damage from saw cutting operation.

After saw cutting, top of survey monument is not to be less than 4 inches nor more than 6 inches below finished grade.

Survey monument frame and/or cover castings that are solid, undamaged and acceptable for reuse are to be cleaned of all extraneous materials and reset.

Survey monument frame and/or cover castings that are damaged or otherwise found to be unacceptable for reuse are to be properly disposed of, and new replacement survey monument frame and cover installed.

Survey monument that is structurally damaged by saw cutting operation, is to be replaced with new survey monument at Contractor's expense.

B. Without Maps and Surveys Assistance

Theoretical position of survey monument is to be re-established with new drill hole, and new survey monument certification prepared.

C. With Maps and Surveys Assistance

Maps and Surveys Office will set position of survey monument with new drill hole, and prepare new survey monument certification.

S626-3.06 Abandon Existing Survey Monument

Carefully excavate for and remove survey monument frame and cover. Survey monument frame and/or cover castings that are solid, undamaged and acceptable for reuse are to be salvaged, cleaned of all extraneous material in such manner as to be non-deleterious to material, and safely stored on site for pick up by Maps and Surveys office.

Survey monument structure is to be abandoned in place. Excavate for and remove top portion of survey monument structure to minimum depth of 12 inches below finished grade.

Excavation is to be backfilled with select granular backfill and disturbed surface area restored.

Survey monument frame and/or cover castings that are damaged or otherwise found to be unacceptable for reuse are to be properly disposed of.

S626-3.07 Survey Monument Frame and Cover

Survey monument frame and cover is to be centered over survey monument, set flush with finished grade and be true to line and grade, make full and even bearing on underlying surface, with cover being non-rocking when in place.

S626-3.08 Replacement Survey Monument Frame and Cover

Replacement survey monument frame and cover are to be new castings, furnished and installed to replace missing or damaged survey monument frame and cover castings.

S626-3.09 Reset Existing Survey Monument Frame and Cover

Carefully excavate for and remove survey monument frame and cover.

Survey monument frame and/or cover castings that are solid, undamaged and acceptable for reuse are to be cleaned of all extraneous materials and reset.

Survey monument frame and/or cover castings that are damaged or otherwise found to be unacceptable for reuse are to be properly disposed of, and new replacement survey monument frame and cover installed.

S626-3.10 New Brass Disc Survey Marker (RCS)

A. General

Where physical conditions prohibit installation of granite survey monument, new brass disc survey marker may be installed, only with prior written approval of Maps and Surveys office.

Representative of Maps and Surveys office will inspect proposed installation site, determine if conditions warrant brass disc survey marker installation, and if warranted provide written authorization and direction.

Use of brass disc survey marker without prior written approval may result in replacement of brass disc survey marker with granite survey monument and recertification, at Contractor's expense.

Brass disc survey marker is to be embedded and recessed until only top of dome is above grade and fully exposed.

Theoretical position of monument line intersection is to be set on top of brass disc with punch mark and cross in accordance with Subsection S626.04 Horizontal Control Survey Monument (RCS) - Theoretical Position Marking.

B. Installation in Paved Area

Brass disc survey marker located within new concrete or asphalt area is to be installed while material has not fully set-up and is still workable.

Brass disc survey marker located within other new paved areas or within existing paved area, drill hole minimum 1/8 inch larger than brass disc survey marker. Brass disc survey marker is to be installed centered in hole and infixed in placed with non-shrink grout. Clean brass disc dome and surrounding area until all excess grout material has been removed.

C. Installation over Subsurface Obstruction

Brass disc survey marker is to be installed complete with survey monument frame and cover on top of and centered on 12 inch diameter Class K concrete base. Survey monument frame and cover are to be installed in accordance with Subsection S626-3.07 New Survey Monument Frame and Cover.

Concrete base is to extend down to and rest on top of subsurface obstruction, with minimum of two 1/2 inch diameter PVC pipe weeps installed thru top of concrete base and into surrounding backfill material.

Where necessary, top of subsurface obstruction is to be coated with bituminous waterproofing coating material, 12 inches all around concrete base.

S626-3.11 Replace Existing Survey Monument with New Survey Monument

Existing survey monument and frame and cover are to be replaced with new survey monument and new frame and cover.

Carefully excavate for and remove existing survey monument frame and cover. Existing survey monument frame and/or cover castings that are solid, undamaged and acceptable for reuse are to be salvaged, cleaned of all extraneous material in such manner as to be non-deleterious to material, and safely stored on site for pick up by Maps and Surveys office.

Existing survey monument frame and/or cover castings that are damaged or otherwise found to be unacceptable for reuse are to be properly disposed of.

Existing survey monument is to be properly disposed of.

S626-4 SURVEY MONUMENT - SURVEY, SUBMITTAL AND CERTIFICATION REQUIREMENTS

S626-4.01 General

In developing theoretical block street line configuration and subsequent monument lines, monument line intersections and horizontal control survey monument positions, City of Rochester official “SBL Mapping” should be basis, in conjunction with more detailed data available from City District Mapping System and various land data records.

Required data for survey monument certification submittal is to be prepared by NYS Licensed Land Surveyor and provided to Project Manager for delivery to, review and approval of Maps and Surveys office.

S626-4.02 Minimum Horizontal Control Survey Specifications (RCS)

Minimum station spacing:

- 300 feet

Horizontal directions:

- 2 positions, direct and reverse (main traverse)
- 5 seconds rejection from mean of 2 direct and reverse
- 1 position, direct and reverse (side shots)

Reciprocal vertical angles on theodolite traverses:

- 1 direct and reverse
- 20 seconds maximum spread

Maximum angular misclosure:

- 10 seconds $\sqrt{N}$ = number of sides/traverse angles
- not to exceed 5 seconds per station

Minimum positional closure:

- 1:20,000 closure after angle error distribution

Only properly maintained, 1 second least count, directional theodolites or total stations is to be used.

Only tripod fixed, precisely marked targets and prism with centers resolvable at minimum control station spacing is to be used.

Stable, properly maintained tripods are to be used.

Tribrach and instrument optical plummets is to be adjusted to within 0.003 of foot at 5.00 foot height of instrument.

Deviation from minimum specifications may be granted in writing by Maps and Surveys office under certain circumstances.

Electronic Distance Meters (EDM):

- must be capable of high degree of resolution and small inherent error, to maintain high relative accuracy on typically short traverse legs of City Survey lines - not to exceed Å (03MM + 2 PPM), verified by baseline results
- must have been calibrated on any NGS certified EDM baseline within last 6 months and data showing same provided with each Project submittal - include make, model and instrument serial number
- steel taping of short distances to be accomplished with calibrated invar tape or tape compared to standardized tape with applied temperature, sag, tension and slope corrections
- meteorological conditions is to be measured on site, recorded and corrections applied (temperature measured to 1°F, pressure measured to 0.10 inch mercury)
- EDM distances of traverse legs is to be mean of minimum of 5 measurements in each direction

As minimum, block containing survey monument to be set is to be traversed and all existing survey monument stones on both sides of streets are to be located and used in analyzation.

As minimum, field locations of three existing marked RCS survey monuments is to be analyzed in determination of each RCS survey monument to be set. Final scope of located RCS survey monument required to reliably fit developed theoretical figure to existing field locations of RCS survey monuments is professional judgement decision of NYS Licensed Land Surveyor.

S626-4.03 Required Data for Horizontal Control Survey Monument (RCS) Certification Submittals

Complete Land Surveyor sealed copies of EDM calibration performed within 6 months of monument work. Calibration is to be performed on any NGS certified EDM baseline. Provided data will include final reduced results, adjustment made and instrument make, model and serial number.

Complete Land Surveyor sealed copies of field notes demonstrating adherence to minimum survey specifications (RCS) and noting:

- date and temperature
- crew
- instrument make, model and serial number

Traverse print out indicating:

- raw angular closure
- closure after angular error distribution
- final adjusted traverse configuration

Point number sheet for Project area with corresponding coordinate dumps presented in manner clearly delineating theoretical points from physical field measured points with complete description of field point.

Reference to SBL maps, District maps and any other data sources used to develop theoretical block configurations.

Outline of adjustments, both linear and angular, made to record block configurations to create closed figures.

One 3 inch by 5 inch certification card for each survey monument.

S626-4.04 Horizontal Control Survey Monument (RCS) Certification Card

Submittal of one 3 inch by 5 inch certification card on standard card stock, in format shown in Contract Documents, is required for each survey monument to be certified.

Provide minimum of five angle and distance ties to substantial, well defined and described, permanent points from RCS monument drill hole or punch mark and cross set. Ties to nails in trees are not acceptable.

Top of RCS granite survey monument is to be marked with 1/8 to 1/4 inch diameter drill hole minimum of 3/8 inch deep, and minimum of 1/2 inch from outer edge of monument stone.

Maps and Surveys office will furnish monument number to be shown on certification card.

On back of each card print certification, and affix NYS Licensed Land Surveyor's seal with signature and date.

Certification:

> "*I _____(printed name)_____ NYSPLS # _____ hereby certify to the City of Rochester that the monument shown on the reverse side has been established on a 4.00 foot offset from the property lines (right of way) and that the monument line intersection has been marked with a drill hole or punch mark and cross. All in accordance with City of Rochester Specification S626.*"

Where appropriate, certification is to be to real position if different requirements apply. Variation is to be approved of by Maps and Surveys office and correctly described.

S626-4.05 Minimum Vertical Survey Specifications (RTS)

Instrumentation, calibration procedures, field and office procedures is to be in accordance with Federal Geodetic Control Committee Standards and Specifications to attain Second Order Class II results.

Peg test and rod calibration to be performed within 7 days prior to runs.

Minimum acceptable closures to be:

- 0.033 of foot $\sqrt{run\ in\ miles}$

Level runs to begin at either an RTS monument or Geodetic Control Monument with published Rochester "City Datum" value, turn through new RTS monument set and close to second RTS or Geodetic Control Monument within specified tolerances.

Published Rochester "City Datum" elevations is to be obtained from Maps and Surveys office.

S626-4.06 Required Data for Vertical Control Survey Monument (RTS) Certification Submittal

Copy of field level peg test and rod calibration performed within 7 days prior to level runs to include date, instrument and serial number.

Complete original field notes or Land Surveyor sealed copies demonstrating adherence to specified Second Order Class II standards and noting:

- date
- crew
- instrument make, model and serial number
- published elevations
- measured elevations
- closure

Summary of adjustments performed.

One 3 inch by 5 inch certification card for each survey monument.

S626-4.07 Vertical Control Survey Monument (RTS) Certification Card

Submittal of one 3 inch by 5 inch certification card on standard card stock, in format shown in Contract Documents, is required for each survey monument to be certified.

Provide minimum of 3 swing ties to substantial, well defined and described permanent points. Ties to nails in trees are not acceptable.

Show measured "City Datum" elevation of new survey monument set and elevation of each reference benchmark used with corner description of each.

Maps and Surveys office will furnish monument number to be shown on submitted certification cards.

On back of each card print certification, and affix NYS Licensed Land Surveyor's seal with signature and date.

Certification:

> "*I _____(printed name)_____ NYSPLS # _____ hereby certify to the City of Rochester that the vertical control monument shown above has been established in the City of Rochester datum using proper methods to establish Second Order accuracy. (Class II) 0.033' $\sqrt{loop\ in\ miles}$."*

S626-4.08 Monument Ties

Suggested tie types to include but not be limited to:

- drill hole in concrete walk
- drill hole in concrete walk as point on line to adjacent monument
- drill hole in curbing
- masonry building corner
- drill hole in light pole base, sign base, signal box base, et cetera
- masonry porch corner or step
- chiseled cross in manhole rim, anchor bolt or metal pole
- drill hole in water table
- PK or Mag nail in wooden utility pole
- set iron pin with cap (on sites void of potential tie objects)
- for RCS angle and distance ties 0° origin can be adjacent monuments or long definable naturals such as building corners, church steeples, tower apexes, atoll lights or intersection stations

In general:

- attempt to spread ties through 360° for strength of resection
- diversify tie types with no more than two ties to single type
- if ties are taken on construction job avoid ties to manhole rims, curbing, et cetera, that will be destroyed
- per City Forestry no ties to points in City trees are acceptable
- ties are to be taken to substantial, well defined and described, permanent points
- angle ties shown are to be average of minimum of 1 direct and 1 reverse reading

S626-5 METHOD OF MEASUREMENT

Quantity to be measured for payment will be number of units installed, reset, adjusted, replaced, abandoned or removed.

No payment will be made for destroyed survey monuments and their re-survey as defined under Section S626-3 Construction Details.

S626-6 BASIS OF PAYMENT

S626-6.01 General all Items

Unit price bid for all items includes cost of: coordination with and obtaining approval from Maps and Surveys office; related survey work; preparation and submittal of survey data and monument certification cards; excavation; furnishing and installing select granular fill; and furnishing all labor, material and equipment necessary to complete work.

Excavation that is included in pay item does not include rock excavation. Rock excavation will be paid for under separate bid item.

Payment for new survey monument installation will be made as follows: Fifty percent (50%) will be paid upon completion of installation and acceptance of new survey monument. Remaining fifty percent (50%) will be retained until all of required survey monument certification record information has been submitted to and approved of by Maps and Surveys office. Failure to correct any erroneous or incomplete survey monument certification record information, will result in forfeiture of retained fifty percent (50%).

Within project limits, survey monuments found destroyed commencing on start work date, and responsible party is unclear or undeterminable, are to be replaced at Contractor's expense.

S626-6.02 New Horizontal Control Survey Monument (RCS)

Unit price bid also includes cost of: furnishing and installing new granite survey monument including frame and cover; setting and marking theoretical position; drill hole.

S626-6.03 New Vertical Control Survey Monument (RTS)

Unit price bid also includes cost of: furnishing and installing new concrete survey monument including frame and cover; rebar; cap with plastic insert; establishing elevation.

S626-6.04 Vertical Adjustment of Existing Horizontal Control Survey Monument (RCS)

A. General

Unit price bid also includes cost of: removing, cleaning, and resetting survey monument frame and cover; saw cutting and redressing top of horizontal control survey monument; furnishing and installing new horizontal control survey monument to replace horizontal control survey monument structurally damaged by saw cutting operation.

Furnishing and installing new survey monument frame and cover as replacement for damaged or unacceptable existing survey monument frame and cover will be paid for under separate bid item.

B. Without Maps and Surveys Assistance

Unit price bid also includes cost of: establishing theoretical position of horizontal control survey monument; drill hole; preparation of survey monument certification.

C. With Maps and Surveys Assistance

Establishing position of horizontal control survey monument, drill hole and preparation of survey monument certification will be done by Maps and Surveys office.

S626-6.05 Abandon Existing Survey Monument

Unit price bid also includes cost of: removing, cleaning and salvaging survey monument frame and/or cover castings that are solid, undamaged and acceptable for reuse; storing, notifying and making arrangement for pickup of salvaged survey monument frame and/or cover; disposing damaged survey monument frame and/or cover; abandoning existing survey monument in place; removing portion of existing survey monument; restoring disturbed surface area.

S626-6.06 New Replacement Survey Monument Frame and Cover

Unit price bid also includes cost of: furnishing and installing new survey monument frame and cover to replace missing or damaged survey monument frame and cover; removing and disposing existing damaged survey monument frame and cover.

No payment will be made under this item for furnishing and installing new survey monument frame and cover that are installed as part of new survey monument installation.

S626-6.07 Reset Existing Survey Monument Frame and Cover

Unit price bid also includes cost of: removing, cleaning and resetting existing survey monument frame and cover.

Furnishing and installing new survey monument frame and cover as replacement for damaged or unacceptable existing survey monument frame and cover will be paid for under separate bid item.

S626-6.08 New Brass Disc Survey Marker (RCS) (Furnished)

A. General

Unit price bid also includes cost of: making arrangements for and picking up brass survey marker from Maps and Surveys office; installing brass survey marker; setting and marking theoretical position with punch mark and cross.

B. Installation in Paved Area

Unit price bid also includes cost of: drill hole; furnishing and installing non-shrink grout; cleaning brass disc dome and surrounding area of excess grout.

C. Installation over Subsurface Obstruction

Unit price bid also includes cost of: furnishing and installing new concrete base; survey monument frame and cover; Class K concrete; PVC pipe weeps; bituminous waterproofing coating material.

S626-6.09 Replace Existing Survey Monument with New Survey Monument

A. General

Unit price bid also includes cost of: removal and disposal of existing survey monument; removing, cleaning, storing and making arrangement for pick up existing survey monument frame and/or cover; disposal of damaged or unacceptable existing survey monument frame and/or cover.

B. Horizontal Control Survey Monument (RCS)

Unit price bid also includes cost of: furnishing and installing new granite survey monument including frame and cover; setting and marking theoretical position; drill hole.

C. Vertical Control Survey Monument (RTS)

Unit price bid also includes cost of: furnishing and installing new concrete survey monument including frame and cover; rebar; cap with plastic insert; establishing elevation.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S626.02	New Horizontal Control Survey Monument (RCS)	Each
S626.03	New Vertical Control Survey Monument (RTS)	Each
S626.0401	Vertical Adjustment of Existing Horizontal Control Survey Monument (RCS) – without Maps and Surveys Assistance	Each
S626.0402	Vertical Adjustment of Existing Horizontal Control Survey Monument (RCS) – with Maps and Surveys Assistance	Each
S626.0501	Abandon Existing Survey Monument	Each
S626.0601	New Replacement Survey Monument Frame and Cover	Each
S626.07	Reset Existing Survey Monument Frame and Cover	Each
S626.08	New Brass Disc Survey Marker (RCS) - in Paved Area (Furnished)	Each
S626.09	New Brass Disc Survey Marker (RCS) – over Subsurface Obstruction (Furnished)	Each
S626.10	Replace Existing Horizontal Control Survey Monument with New Horizontal Control Survey Monument (RCS)	Each
S626.11	Replace Existing Vertical Control Survey Monument with New Vertical Control Survey Monument (RTS)	Each

REVISED September 26, 2019