

SPECIFICATIONS FOR

CENTENNIAL PARK PLAY UNIT

Prepared for:
Village of Orland Park
14700 Ravinia Ave
Orland Park, IL 60462

August 8, 2012

BIDS DUE
11 AM, August 22, 2012
Office of the Village Clerk
14700 S. Ravinia Avenue
Orland Park, IL 60462

SECTION 000100

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SECTION 000150

LIST OF DRAWINGS

The following is a complete list of drawings that constitute the bid package. Technical specifications and project manual is intended to supplement these drawings.

Sheet Number	Sheet Name	Most Current Date
L-00	Cover Sheet	8/6/12
L-01	Notes/Site Amenities Schedule	8/6/12
L-02	Planting Details	8/6/12
L-03	Grading & Layout Plan	8/6/12
L-04	Grading & Layout Plan	8/6/12
L-05	Landscape Plan	8/6/12
L-06	Details	8/6/12
L-07	Details	8/6/12

END OF SECTION

DIVISION 1

GENERAL REQUIREMENTS

SECTION 011100

SUMMARY OF WORK

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED:

- A. Title of Work.
- B. Work by Others and Future Work.
- C. Contractor Use of Premises.
- D. Coordination.
- E. Field Engineering.
- F. Reference Standards.
- G. Protection.

1.02 WORK COVERED BY CONTRACT DOCUMENTS:

This Contract covers site improvements, for the project titled Centennial Park Play Unit

1.03 WORK BY OTHERS AND FUTURE WORK:

Work on the Project which will be executed or substantially complete prior to start of work of this Contract, and which is specifically excluded from this Contract:

- A. Demolition
- B. Grading to specified elevation (See sheet L-00)

1.04 CONTRACTOR USE OF PREMISES

- A. Coordinate use of premises under direction of Owner's Representative.

1.05 COORDINATION:

- A. Coordinate work of the various Specification Sections to assure efficient and orderly sequence of construction. Make accommodations for items to be installed later.
- B. Integrate elements of work; uncover ill-timed, defective, and non-conforming work; and provide samples for testing, as required by Site Work and Technical Specifications, and as requested by the owner or owner's representative.

1.06 FIELD ENGINEERING:

A. SURVEYS, LINES, AND GRADES

Contractor shall provide all surveys to establish reference points for construction. Contractor shall be responsible for laying out the Work (unless otherwise specified), shall protect and preserve established reference points, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Owners Representative whenever any reference point is located or destroyed or requires relocation before necessary changes in grades or locations.

1. All Work done under this Contract shall be done to the lines, grades, and elevations shown on the Drawings. The Contractor shall keep the Owners Representative informed, a reasonable time in advance, of the times and places at which he wishes to do work in order to ensure proper coordination between trades has been performed.
2. Any Work done without being properly located and established by base lines, offset stakes, benchmarks, or other basic reference points located, established, or checked by the Owners Representative may be ordered removed and replaced at the Contractor's cost and expense.
3. All stakes, benchmarks, and other survey points shall be preserved by the Contractor.

B. AS-BUILTS

1. Upon completion of construction, provide one complete as-built mylar and record documents of drawings for the irrigation system, landscape, and all structural elements produced from contractor's notes and cut sheets.
2. At the onset of installation obtain one set of full sized, mylar originals of the project, and digital copy of construction drawings, from the Landscape Architect. The cost for reproduction of mylars shall be bourn by the contractor. The Landscape Architect will provide these drawings for the contractor, for printing costs only. Make full sized print outs for every month on the project and at the end of every week, revise copies for work accomplished that week in red ink. As-built copies shall be brought up-to-date at the end of every month.
3. Upon completion of project, submit for review, prior to final acceptance, final set of as-built drawings to Owner. This set shall be printed at full size.
4. Final as-builts may be submitted in a digital format, compatible with the most current version of AutoCAD.
5. A scanned copy of as built will be acceptable if provided as a JPEG file with a resolution of 150 dpi or greater.

1.07 REFERENCE STANDARDS:

- A. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. The date of the standard is that in effect as of the Bid date, or date of Owner-Contractor Agreement when there are no bids, except when a specific date is specified.

END OF SECTION

SECTION 013100

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED:

- A. Pre-construction Conferences.
- B. Progress Meetings.
- C. Pre-installation Review.

1.02 RELATED REQUIREMENTS:

Section 01300 - Submittals: Progress Schedules.

1.03 PRECONSTRUCTION CONFERENCE:

Owner's Representative will administer a pre-construction conference for execution of Owner-Contractor Agreement, exchange of preliminary submittals, clarification of Owner and Contractor responsibilities in use of site, and for review of administrative procedures.

1.04 PROGRESS MEETINGS:

- A. Contractor, Owner, and Owner's representative shall schedule and administer project meetings and inspections throughout the course of the work on a regular basis and/or at critical intervals.
- B. Attendance: Job superintendent, major subcontractors and suppliers, and Owner's Representative, as appropriate to agenda topics for each meeting.
- C. Suggested Agenda: Review progress of work, adjustments to progress schedule, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting the Work.
- D. Owner's representative will take meeting notes (or minutes) for all inspections and project meetings. Within five working days of the meeting, owner's representative will issue these notes, as a "Field Report", by e-mail to all participants, or other parties effected by decisions or schedules developed during this meeting. All parties should review these notes for accuracy and omissions. Any corrections to meeting notes should be noted within five business days after receipt of the report. After such time, these notes will be filed as a record of the meeting.
- E. Field reports will serve as the overriding document in the event of any disputes.

1.05 PRE-INSTALLATION REVIEW:

- A. When required in individual Specification Section, schedule a pre-installation review. Notify Owner's Representative three days in advance.
- B. Require attendance of entities affected by the Work, job superintendent, and subcontractor performing the installation.

1.06 SITE OBSERVATION VISITS:

- A. Provide access to and review information with Owner's Representative during regularly scheduled site visits for progress meetings.
- B. Information to be reviewed: work in progress, problems or conflicts, material samples, testing, and other items affecting the work.
- C. Contractor should attempt to schedule inspections during the regular meeting times, however certain items may require special trips to avoid delays in production schedules. Contractor should attempt to schedule these meetings one week in advance, and schedule multiple inspections on single visits.

END OF SECTION

SECTION 013300
SUBMITTAL PROCESS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED:

- A. Procedures
- B. Construction Progress Schedules
- C. Schedule of Values
- D. Shop Drawings
- E. Materials List
- F. Manufacturer's Data
- G. Field Samples

1.02 PROCEDURES:

- A. Deliver submittals to the Owner's Representative.
- B. Submit a minimum of one copy for the Contractor's records, plus two copies which will be retained by Owner's Representative.
- C. Identify Project, Contractor, subcontractor, major supplier. Identify pertinent Drawing sheet and detail number, and Specification Section number, as appropriate. Identify deviations from Contract Documents. Provide space for Contractor and Owner's Representative review stamps.
- D. After Owner's Representative's review of submittal, revise and resubmit as required, identifying changes made since previous submittal.
- E. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

1.03 CONSTRUCTION PROGRESS SCHEDULES:

- A. Submit two copies of initial progress schedule within 10 days after date of Owner-Contractor Agreement. One copy shall be submitted to the Owner's representative, the other submitted to the owner. After review by Owner's Representative, revise and resubmit as required.
- B. Use horizontal bar chart (or Gantt Chart) with separate bar for each major trade or operation, identifying first work day of each week.
- C. Show projected percentage of completion for each item of Work at each Application for Progress Payment.
- D. Show submittal dates required for shop drawings, product data, and samples, and product delivery dates, including those furnished by Owner.
- E. Submit revised schedules on a bi-weekly basis, or as requested by the Owner's Representative. Identify changes since previous submittal.

1.04 SCHEDULE OF VALUES:

- A. Submit schedule of values, within bid form. After award of project, the winning bidder shall submit two additional copies of the bid to the Owner's Representative. One copy will be kept by the owner, the other copy will be retained by the owner's representative.
- B. Include in each line item a directly proportional amount of Contractor's overhead and profit.
- C. Revise schedule to list change orders. Submit revised schedule with application for payment.
- D. Owner or owner's representative may request all applicable back up information to justify quantities shown on pay applications. Back up may be in the form of invoices, purchase orders, delivery tickets, and visual inspection.
- E. If this is a unit price type bid. Quantities may be less than, or exceed the values shown on the supplement to the bid form. Prior authorization must be obtained before exceeding these quantities.

1.05 SHOP DRAWINGS:

- A. When required in individual Specification Section or on Drawings, submit the number of opaque reproductions which Contractor requires, plus one copy which will be retained by Owner's Representative.
- B. Show products required for proper installation, their relative locations, and critical dimensions.
- C. Identify deviations from the Contract Documents.

1.06 MATERIALS LIST:

When required in individual Specification Section, submit a list of materials included in the work of that section. Identify manufacturer, trade name, and model name, as applicable. Submit within 10 days after date of Owner-Contractor Agreement.

1.07 MANUFACTURER'S DATA:

When required in individual Specification Section or on Drawings, submit manufacturer's data for delivery, storage, assembly, installation, start-up, adjusting, and finishing.

1.08 FIELD SAMPLES:

Provide field samples of finishes at Project site as required by individual Specification Section. Install sample complete and finished. Acceptable samples in place may be retained in completed Work.

1.09 MOCK UPS

- A. Where required by individual specification sections, the contractor shall coordinate all mock ups (or test panels) with owner's representative for review. Mock ups must receive approval prior to commencing activity.
- B. All masonry work will require approval of a test area.

END OF SECTION

SECTION 016600

PRODUCT STORAGE AND HANDLING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Products.
- B. Transportation and Handling.
- C. Storage and Protection.
- D. Product Options.
- E. Substitutions.

1.02 RELATED DOCUMENTS
Section 01300 - Submittals: Materials list.

1.03 PRODUCTS

- A. Products include material, equipment, and systems.
- B. Components required in quantity shall be interchangeable. Should these components be exposed to view, purchase the quantity required for the Work from a single manufacturer.

1.04 TRANSPORTATION AND HANDLING

- A. Transport products by method to avoid product damage; deliver in dry, undamaged condition in manufacturer's unopened packaging.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

1.05 STORAGE AND PROTECTION

- A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather tight enclosures.
- B. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged and required storage conditions are met.

1.06 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Provide any product meeting those standards.
- B. Products Specified by Naming One or Several Manufacturers: Provide products of named manufacturers meeting specifications. No substitutions allowed without prior approval.

END OF SECTION

DIVISION 2

SITE WORK TECHNICAL SPECIFICATIONS

SECTION 027122

ORNAMENTAL METAL FENCE

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the specified ornamental metal fence system.

1.02 RELATED WORK

- A. Refer to Sections on Earthwork
- B. Refer to Sections on Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total fence system to include all components (i.e., panels, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

- A. American Society for Testing and Materials (ASTM) Standards
 1. Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process (A653/A653M)
 2. Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process (A924/A924M)
 3. Practice for Operating Salt Spray (Fog) Apparatus B117
 4. Test Method for Specular Gloss (D523)
 5. Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. (D822)
 6. Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. (D1654)
 7. Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. (D2244)
 8. Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact). (D2794)
 9. Test Method for Measuring Adhesion by Tape Test. (D3359)

1.06 SUBMITTAL

The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

PART 2 - PRODUCTS

2.01 MANUFACTURER

The fence system shall conform to fence style manufactured by manufacturer Ameristar Fence, Montage Plus – Majestic Style, 4', black. Contact: Eric Rudd, Ameristar, PH 847.612.3124

2.02 FABRICATION

- A. Pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.
- B. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture.
- C. Completed panels shall be capable of supporting a 200 lb. load (applied at midspan) without permanent deformation.
- D. Gates shall be fabricated using welded ornamental panel material and gate ends having a 1-1/4" square cross-sectional size. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 INSTALLATION

- A. Fence posts shall be set with equal spacings, plus or minus 1/2".
- B. Fence panels shall be attached to posts with brackets supplied by the manufacturer.
- C. Gate posts shall be spaced according to the gate openings specified in the construction plans.

3.03 CLEANING

The contractor shall clean the jobsite of excess materials. Post hole excavations shall be scattered uniformly away from posts.

END OF SECTION

SECTION 022000

EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY:

This section covers work necessary for cutting and filling and regrading of soil to the proposed grades shown on plans. It includes completion of stripping and replacing topsoil, earthwork, preparation of subgrade for concrete flatwork, and other related work items.

The extent of excavation, filling and grading is shown on the drawings.

1.02 RELATED SECTIONS:

- A. Concrete Formwork: Section 02500
- B. Concrete Pavement and Improvements: Section 02510
- C. Landscaping: Section 02900

1.03 REQUIREMENTS OF REGULATORY AGENCIES

- D. "Occupational Safety and Health Administration" (OSHA) standards for job site conditions are made by reference a part of this section.
- E. The contractor is to perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction over this work. The contractor is to obtain and pay for any and all permits required to proceed with this work.

1.04 PROTECTION

- F. The contractor is responsible for the protection of existing buildings, structures, adjoining properties, existing landscape and irrigation, public thoroughfares and existing grades outside construction limits from damage and disruption due to work under this section.
- G. Protect existing utilities to remain from damage. Request all utility companies to field locate facilities prior to construction start.
- H. Existing utilities shown on drawings are based on best available data but cannot be assumed to be 100 percent accurate without field verification by the contractor.

1.05 LAYOUT, LINES, AND LEVELS

- I. Before earthwork operations are started, all grading shall be staked by the owner's surveyor, for the Owner's representatives approval.
- J. The drawings indicate existing elevations and proposed elevations. The existing elevations and elevations to be established are given for the convenience of the contractor to assist him in arriving at the quantities of excavation, grading, backfilling, etc. The contractor shall verify all elevations existing at the site prior to excavation as there shall be no additional compensation for any additional work once operations have commenced.
- K. Any areas that appear to be low, and/or holding water shall be re-staked and re-graded to drain properly.

PART 2 - PRODUCTS

2.01 FILL MATERIALS

General fill material for the project - Selected excavated material existing on site shall be used for rough fill and for backfill. Fill shall be placed in 8 inch lifts maximum and all disturbed areas shall be blended evenly into existing grades. On site soil used in fill operations shall be clean, free from frozen material, debris and organic substances and shall not be in muddy condition. Soils under

concrete walks shall be worked to have a liquid limit not greater than 40 and a plasticity index not greater than 20.

PART 3 - EXECUTION

3.01 SITE EXAMINATION

Visit and examine the site and take into consideration conditions affecting the work. Failure to visit the site will not relieve the contractor of furnishing materials or performing work required to complete work under this section, as indicated or specified, at no additional cost to the Owner.

3.02 REFERENCE POINTS

Carefully maintain and establish bench marks, monuments, batter boards and reference points in a location and method approved by the Owner's Representative. If disturbed or destroyed, replace as directed.

3.03 CLEARING SITE

- A. Clear the site within the contract limits as indicated. Do not bury or cover organic or decomposable debris of any nature on site: dispose of properly off the site.
- B. All excavated material unsuitable for embankment or as directed by the Owner's Representative, shall be removed and disposed of properly off the site.

3.04 EXCAVATION

- A. Excavation or cutting includes all material encountered to whatever depth indicated on the plans. Material to be excavated shall be unclassified and is assumed to be earth, and materials that can be removed with a large excavator or D-9 dozer. Material encountered, and determined by the Owner's representative, to be unsuitable for fill material shall be hauled off site by the contractor.
- B. Excavate to levels as required to complete work indicated including cuts required under concrete slabs, foundations, paving and sitework. Allow sufficient batter, clearance and excavation for proper placing of formwork. Do other excavating, shifting of earth and filling necessary for bracing, access, and safety to workmen. Excavate to indicated elevations with allowances for proper fill material, slab, voids, forms, and foundations.
- C. Excavate unsatisfactory soil materials encountered to the extent required below elevations, as directed by the Owner's representative.
- D. The bottom of excavations shall be level undisturbed earth. Do not carry excavation below indicated depths. Remove loose material from all excavations. Excess excavation shall be filled and compacted as specified below or filled with gravel as directed by the Owner's representative.
- E. Foundation Stabilization - If in the opinion of the Owner's soils engineer, material in the bottom of the excavation is unsuitable for supporting structures, the contractor shall excavate unsuitable material as directed by the soils engineer, and backfill to required grades with earth backfill in accordance with "backfilling".

3.05 DRAINAGE

Excavation shall be completed to insure proper grade lines, subsurface compaction, and positive drainage away from foundations and all structural improvements. Excavate to produce drainage patterns as reflected in the grading plans. Contractor shall provide temporary drainage swales, channels, etc. if necessary during construction to provide positive drainage and eliminate excess water collection at foundation, walls or other structures during construction.

3.06 FILLING AND SOIL COMPACTION

- A. General - Fill and compact to levels required to complete the work indicated,
- B. Fill areas - All weed stripping operations shall be completed before filling is begun. The work shall be executed in such a manner that all deep fills are made first so that they may be accorded maximum time for settlement.
- C. Mix or blend the plowed or scarified surface with a disc or grader blade so the surface will be free of large clods or rocks and brought to the proper moisture content for compaction.
- D. Fill areas below paving - Scarify undisturbed soil to a minimum depth of twelve (12) inches and compact to at least 95% standard proctor density. Compact total fill section to the specified density. Extend compaction beyond limits of paving as detailed at +2% optimum moisture content.
- E. Fill areas below planted areas - Scarify to a minimum depth of six (6) inches and compact to at least 90% of standard proctor density, +3% optimum moisture content.
- F. Cut areas below structures and paving - Scarify to a minimum depth of twelve (12) inches and compact to at least 95% standard proctor density, +2% optimum moisture content.
- G. Cut areas below planted areas - Scarify to a minimum depth of six (6) inches and compact to at least 90% of standard proctor density, +3% optimum moisture content.
- H. Placing Fill - Distribute material so as to avoid formation of lenses or layers of material differing substantially from surrounding material. Deliver material at uniform rate to permit satisfactory procedure to result in well and uniformly compacted fill. Avoid unnecessary concentration of travel causing ruts and uneven compaction. Re-grade and compact ruts and hollows more than 6 inches deep before compacting. Spread fill material in horizontal layers not greater than 6 inches thick. If, in the opinion of the soils engineer, the material proposed for use in the compacted fill is too wet, too dry or frozen to permit adequate compaction, it shall be corrected in an acceptable manner prior to placement and compaction.
- I. Moisture Control - Material in each layer during compaction shall be rolled and contain the appropriate amount of moisture required for optimum compaction, as nearly as practicable, as specified above.
- J. Moisture content shall be uniform throughout layers. Add necessary moisture to fill material at borrow source if, in the opinion of the soils engineer, it is not possible to obtain uniform moisture content by adding water on fill surface.
- K. Compaction - When moisture content and conditions of each spread layer are satisfactory, compact by methods approved by the soils engineer to the density indicated. If a sheeps foot roller is to be used the feet of the roller shall extend approximately (8) inches in clear projection from roller cylindrical surface and spaced to provide approximately one tamper foot per one hundred (100) square inches of roller area. Provide roller with cleaner bars designed and attached to prevent accumulation of material between tamper feet. Roller type to have weight increased by addition of water or sand or both. Weight of roller when fully loaded shall be not less than four thousand (4,000) pounds per linear foot.

Compaction Requirements:

ASTM D-698: STANDARD PROCTOR COMPACTION

Foundation backfill	95%
Landscape areas	80-85%
Sidewalks, Flatwork	95%

3.07 TESTING

- A. Testing shall occur to determine that the standard proctor compaction requirements set forth in Section 3.07 have been met. A certified soil engineer shall be retained by the owner to administer the appropriate tests to determine compaction density. The owner shall pay all costs necessary to complete the initial tests. Any subsequent testing required due to failure in meeting the compaction requirements shall be born by the contractor.
- B. In the event that testing should determine that the compaction requirements have not been met, the contractor shall employ all necessary methods and actions to meet these requirements. All costs incurred during subsequent testing to determine acceptable compaction shall be paid by the contractor.

3.08 BALANCE OF CUT AND FILL

- A. The drawings indicate existing elevations and proposed elevations. The existing elevations and elevations to be established are given for the convenience of the contractor to assist him in arriving at the quantities of excavation, grading, filling, etc. The contractor shall verify all elevations existing at the site prior to excavation as there shall be no additional compensation for any additional work when operations have commenced.
- B. The Contractor shall be responsible to provide necessary import of specified fill material if existing on site soil is insufficient to produce final proposed grades and likewise the Contractor is responsible for removal and haul off of excess earth or fill material if applicable.

3.09 TOLERANCES

- A. Do cutting, filling, and compacting of fill, rough grading and finish grading as required to bring the entire project area to the grades indicated. The grade shall be within 0.1 ft. of elevations indicated for rough grading.
- B. Make proper allowances for pavement, landscaping, etc., as required by appropriate section of the drawings and specifications.
- C. Grades in shrub beds, mulched areas, or turf areas should not exceed 4:1 (horizontal:vertical) unless specifically approved in advance by the Owner's Representative.
- D. Grading shall be performed so that open space does not drain onto residential lots. The bottom (center line) of swales used to redirect water away from residential lots shall be no closer than three feet to the property line, and no greater than a 4:1 side slope.

3.10 FINISH GRADING

Cut and fill all areas as indicated or required to permit installation of other materials to finish grades indicated. Finish grades shall be held within a tolerance of +0.04'. Allow for subgrade elevations where required or as noted on the drawings and details.

3.11 DAMAGED EARTH

Earth that has been rendered unfit to receive planting due to concrete water, mortar, or lime or other construction waste or debris dumped on it shall be completely removed and replaced with clean earth.

3.12 TOPSOIL/COMPOST SPREADING

After rough grading is completed and approved, the contractor shall spread 4-6" of topsoil over the site. The final grade shall be compacted and bladed smooth to match staking prior to soil preparation operations per the general landscape section. Once topsoil operations have been completed, machine blade and hand rake as necessary to produce a smooth even surface, free of rubbish, rock or large clods. Tolerance of grades shall be as outlined above.

- 3.13 SETTLEMENT
Settlement in backfill, fill or in structure built over backfill or fill, which may occur within one year from final acceptance, shall be corrected by the contractor at no cost to the owner.
- 3.14 MAINTENANCE
Protect newly graded areas from erosion, traffic, and repair, and re-establish grades in settled, eroded, and disturbed areas to specified tolerances through final acceptance of the contract.
- 3.15 FINAL CLEAN-UP
The contractor shall leave the site in an orderly condition free of all debris so that seeding, sodding, planting, and other construction operations may proceed immediately. All areas outside the contract limits which have been disturbed shall be restored to their original condition in accordance with procedures as described herein.

END OF SECTION

SECTION 028750

SITE FURNISHINGS

PART 1 - GENERAL

1.01 SUMMARY

Work covered by this specification concerns all labor, materials and equipment necessary for installation of recreational equipment.

1.02 SUBMITTALS

- A. Product Data
- B. Shop Drawings
- C. Samples
- D. Contract Closeout Submittals
 - 1. Project Record Documents
 - 2. Operation and Maintenance
- E. Data Warranty

PART 2 - PRODUCTS

2.01 SITE FURNITURE AND ACCESSORIES

- A. Bench
DuMor, Model 164-60, as distributed by NuToys, Box 2121, LaGrange, Illinois, (800)526-6197.
Bench shall be 6' length, surface mounted, green..
- B. Stadium Seats
Model 505-P- green, as distributed by American Seating, 401 American Seating Ctr NW
Grand Rapids, MI, (616) 732-6600.
- C. Trash Receptacle
DuMor, Model 87-22, as distributed by NuToys, Box 2121, LaGrange, Illinois, (800)526-6197.
Trash shall be surface mounted in locations shown on plan. Not included in the order but required by the contractor:
 - 1. 12-gauge spun steel with nylon stops
 - 2. 22 gallon plastic liner
- D. Safety Surfacing
Total Surface, LLC or approved equal, P.O. Box 21, Glenview, IL 60025. Phone 847.657.0808.
Fax 847-483-0322. Website www.totalsurfacellc.com. Email info@totalsurfacellc.com.
- E. Sythetic Turf Play Surfacing
X-Grass Play manufactured X-Grass as distributed by Cunningham Recreation, (800) 438-2780.
- F. Concrete Baseball
Wausau Tile Custom 36" diameter baseball, as distributed by Wausau Tile, PO Box 1520
Wausau, WI, (800)388-8728. Baseball to be acid etched, white finish with red stained stitching.
Shop drawings must be submitted for approval by Owner's Representative.

G. Play Structures

Play structures listed below as distributed by NuToys, PO Box 2121, LaGrange, Illinois,
 (800)526-6197.

Custom playground

(a) Custom Landscape Forms Playground

<u>QTY.</u>	<u>NO.</u>	<u>DESCRIPTION</u>
5-12 Year Olds Structure		
1	144414A	Cloudburst Triple Slide 1 72"Dk DB
1	123331B	Double Poly Slide 48"Dk DB
1	123337A	Single Poly Slide 40"Dk DB
1	123763A	TurboTwister Tunnel Slide DB Only
1	152907B	Deck Link w/Barriers 2 Steps
1	176078A	Lollipop Climber 48"Dk DB
1	153076A	Mini Summit Climber 48"Dk DB
1	157427B	Pod Climber w/Handloop 32"Dk DB
1	122915A	Single Wave Climber 48"Dk Difference
1	176079A	Sunbeam Climber
1	145624D	Vertical Ascent 72"Dk
1	116247A	Vertical Ladder - Panel 24"
1	116249A	Vertical Ladder 32"Dk DB
1	123284B	Wiggle Ladder 40"Dk DB
1	121416B	123"Disc Challenge w/Handhold Panels
1	120325A	Ramp Berm Exit Plate Concrete Wall
4	156232A	Ramp w/Guardrails w/Curbs
2	128623A	Accessible Curb
2	111240A	Balcony Deck
1	164094A	Bongo Reach Panel Above Deck
1	135731A	Chimes Reach Panel Above Deck
1	127953A	Handhold Panel Set
1	127439A	Navigator Reach Panel Above Deck
2	116244A	Pipe Barrier Above Deck
1	159459A	Ring-A-Bell Panel Above Deck
2	125921C	TurboTwister Wire Barrier
3	120314A	Wire Barrier Above Deck
1	120314B	Wire Barrier w/Wheel Above Deck
1	120901A	Grab Bar
1	130567A	Hex Shingle Roof ¹
1	130102B	Super Square Shingle Roof Poly ¹
1	122197A	90* Triangular Tenderdeck
3	178710A	Hexagon Tenderdeck
1	111230A	Square Deck Corner
2	111229A	Square Deck Extension
3	111228A	Square Tenderdeck
2	119646A	Tri-Deck Extension
1	122718E	74"Alum Round Flush Post DB
2	111404H	92"Alum Post DB
5	111404F	108"Alum Post DB

4	111404E	116"Alum Post DB
4	111404D	124"Alum Post DB
5	111404C	132"Alum Post DB
5	111404A	148"Alum Post DB
4	111403E	150"Alum Post For Roof DB
6	111403C	166"Alum Post For Roof DB
3	111404Z	182"Steel Post DB

3-5 Year Olds Structure

1	123331B	Double Poly Slide 40"Dk DB
1	124863C	SlideWinder2 48"Dk DB
1	152431A	ABC Climber 48"Dk DB
1	152907A	Deck Link w/Barriers 1 Step
1	153076A	Mini Summit Climber 40"Dk DB
1	123284A	Wiggle Ladder 32"Dk DB
1	139782A	2"Horizontal Ladder 4-5 Years
1	141887B	Access/Landing Assembly Seat Barrier Left 16"Dk
1	152443A	Peek and Creep w/Barriers
1	117957A	Periscope Panel Above Deck
1	115254A	Storefront Panel
1	115227A	Zoo Panel Above Deck
1	120901A	Grab Bar
2	111275A	Handloop Assembly
1	118110A	Square Poly Roof Custom Logo Panels
1	121948A	Kick Plate 8"Rise
4	111228A	Square Tenderdeck
1	112471A	Transfer Step DB
6	111404G	100"Alum Post DB
2	111404F	108"Alum Post DB
4	111404E	116"Alum Post DB
4	111403D	158"Alum Post For Roof DB
1	120710A	Pod Climber 8" DB

Also:

3	174018A	Belt Seat ProGuard Chains for 8' Beam
2	176038A	Full Bucket Seat ProGuard Chains for 8' Beam
1	177351A	Molded Bucket Seat w/Harness ProGuard Chains
1	177332A	Single Post Swing Frame 8' Beam Height Only
2	177333A	Single Post Swing Frame Addtl Bay 8' Beam
1	113211A	Chimes Panel Ground Level
1	118429A	Periscope Panel Ground Level
1	111293A	Tic-Tac-Toe Panel Ground Level
6	111397H	69" Playshaper Post DB

- (b) Colors: Provide submittal for final color approval by landscape architect
 - (i) Roof: Pine Green
 - (ii) Posts: Pine Green

- (iii) Panels: Blue
- (iv) Decks: Gray
- (v) Slides: Blue
- (vi) Accents: Red
- (vii) Railing: Red

PART 3 - EXECUTION

All items not listed below shall be installed in accordance with the manufacturer's recommendations. Contractor shall submit shop drawings as requested above.

END OF SECTION

SECTION 029140

SOIL PREPARATION

PART 1 - GENERAL

1.01 SUMMARY

Work in this Section includes, ripping, fertilizing, soil conditioning, and fine grading as shown on plans and details, included on construction drawings, as under this contract.

1.02 SUBMITTALS

Submit product data sheet for compost.

1.03 DELIVERY, STORAGE AND HANDLING

Comply with Sections 016000 and 029005

1.04 PROJECT/SITE CONDITIONS

- A. Do not perform work when climate and existing site conditions will not provide satisfactory results.
- B. Vehicular accessibility on site shall be as directed by the Owner's representative. Repair damage to prepared ground and surface caused by vehicular movement during work under this section to original condition at no additional cost to the Owner.
- C. Due to the nature of the site as a redevelopment project, unknown soil conditions may exist on site. This specification is intended to be a standard specification for Soil Preparation for bid purposes only. The contractor shall be responsible for creating a suitable soil medium that ensures healthy plant growth. Immediately following rough grading operations, the contractor shall take multiple soil samples of the site to identify any chemical, structural, or other soil borne issues that would make the soil counter productive to healthy plant growth. This analysis shall include recommendations for additional organic matter required for the soil. Should amendments or additional work be required to make these soils more conducive to healthy plant growth, the contractors shall submit a change order for the modification 30 days prior to start of landscape installation for Owner's Approval. The change order request shall clearly detail any additional work or amendments suggested for those unacceptable soils.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Compost
 1. A totally organic product that has been aerobically and naturally processed without the addition of coarse wood chips, in such a manner as to maintain a consistent temperature of 140 degrees Fahrenheit or greater for a period of time sufficient to create the following characteristics, measured by dry weight.
 - (a) Moisture content of 30%-35%
 - (b) Organic matter to nitrogen ratio: 25:1 to 30:1.
 - (c) pH: 6.0 to 8.0 pH.
 - (d) Salts: maximum of 10 mmhos/cm.
 - (e) Less than 1% soil, dirt or sand.
 - (f) Maximum particle size of ½ inch diameter.
 - (g) Eradication of all harmful weed seeds, pathogens and bacteria.
 - (h) A non-offensive, earth smell.
 2. Acceptable materials are as follows.
 - (a) A-1 Organics - Premium 3

- (b) Front Range Materials (Arvada, Illinois, 303-425-9992)– Ground Compost (Item #18-126)
 - (c) Certified “Class I” compost product
 - B. Topsoil
Top soil shall be well pulverized and supplied by a commercial supplier or as approved by the owner’s representative.
 - C. Fertilizer
 - 1. Fertilizers on areas shall be prescribed as a uniform application. If the owner’s representative or contractor feels specific treatments are in order, soil samples will be taken and sent to a lab for analysis. Costs associated with this testing will be noted as a change order. The following guidelines will be used for soils testing and the resulting fertilizer applications.
 - (a) Formulated fertilizer analysis shall be submitted to Owner’s Representative for review and shall be based upon recommendations made by soil lab. Contractor to submit soil sample to Illinois State University Soils Lab for analysis and fertilizer recommendations.
 - (b) Contractor is to submit a minimum of 6 soil samples to soils lab to obtain recommendations. Soils samples shall be taken from a minimum of 3 areas on site that give a full representation of the different site soil types present. Additional test samples may be necessary if there are more than 3 distinct soil types present on the site. Request recommendations based on proposed planting scheme, irrigated turf, non-irrigated drought-tolerant grass seed, wildflowers and grasses, shrub beds, etc.
 - (c) If soil types are similar in structure, the Contractor may use a consistent formulated fertilizer for the entire site area. However, if soil structures are vastly different, a formulated fertilizer for each specific site area will be required.
 - D. Plant Mix Backfill
 - 1. Plant mix shall be used to backfill around all tree and shrub plantings as indicated on the drawings. The plant mix shall consist of:
 - (a) 2 parts topsoil
 - (b) 1 part sand
 - (c) 2 parts compost
 - (d) 5 parts excavated soil
 - 2. or other nearly similar proportions as determined and approved by the Owner’s representative.
 - 3. The ingredients shall be thoroughly mixed to produce a mix as integrated as possible. This plant backfill mix will not be necessary where planting occurs in the backfilled planters.
 - E. Sodded Area Amendments
Thoroughly mix the following amendments for tilling into all sodded areas.

Specified Compost	5.0 c.y. per 1,000 s.f.
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 - F. Planting Bed Amendments
Thoroughly mix the following amendments for tilling into all bed areas.

Diammonium Phosphate	5.0 lbs. per 1,000 s.f.
Pre-emergent Weed Controller	use manufacturer’s specified rate
Specified Compost	3.0 c.y. per 1,000 s.f.
- 2.02 SOURCE QUALITY CONTROL
- A. Verification of Performance
 - 1. Compost and other soil amendments are typically identified by a rate of cubic yards per 1000 s.f. In order to accurately determine if amendments are applied at the correct rate, the following chart is supplied. This chart is intended to verify the cubic yards by allowing a

method for measuring the depth of the material spread uniformly across the surface of the planting area, with no exposed soil, prior to mixing the amendments with the existing soils. This method will be used during inspections to verify that adequate amendments are incorporated into the soil.

<u>c.y./1000 s.f.</u>	<u>Depth (inches)</u>
3 c.y./1000 s.f.	1"
3.5 c.y./1000 s.f.	1 1/8"
4.0 c.y./1000 s.f.	1 1/4"
4.5 c.y./1000 s.f.	1 1/2"
5.0 c.y./1000 s.f.	1 5/8"

2. An inspection of soil preparation will be performed by the Owner's Representative before areas will be released for planting. The inspection shall consist taking a soil sample to determine
 - (a) Proper tilling of the soil. Soil will be judged on how easily a soil probe can be inserted into the ground.
 - (b) Proper depth of tilling, and homogeneity of the soil. The soil sample will be judged on uniformity of the soil profile in the top six to eight inches.
 - (c) A visual inspection for adequate compost will be conducted. An area that has similar soil structures, that has not received compost will be used as the basis of comparison. Should a disagreement exist, multiple soil samples will be sent to an independent testing laboratory to determine the amount of organic matter present. The cost of this testing will be absorbed by the Owner's Representative.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. General
 1. Verify that existing site conditions are as specified and indicated before beginning work under this Section.
- B. Grades
 1. Inspect to verify rough grading is within +0.2 foot of grades indicated and specified.
- C. Damaged Earth
 1. Inspect to verify that earth rendered unfit to receive planting due to concrete, water, mortar, limewater or any other contaminant dumped on it has been removed and replaced with clean earth from a source approved by the Owner's representative.
- D. Cleanliness
 1. Inspect to verify that site is clean of all trash and debris.
- E. Equipment
 1. Inspect to verify other trades have removed all equipment and staging areas from areas of work.
- F. Unsatisfactory Conditions
 1. Report in writing to General Contractor with copy to Owner.
- G. Acceptance
 1. Beginning of installation means acceptance of existing conditions by installer.

3.02 PREPARATION

- A. Protection

1. Locate sewer, water, irrigation, gas, electric, phone and other pipelines or conduits and equipment prior to commencing work.
 2. Be responsible for proper repair to landscape, utilities, walls, pavements and other site improvements damaged by operations under this section.
- B. Weed Control
1. Remove annual weeds by tilling. Remove perennial weeds by applying herbicide 1 week before soil preparation and as needed, but no sooner than 3 months before beginning work.
 2. If the area to be developed is infested with with noxious or invasive weeds, a chemical application will be required, at a rate recommended on the chemical's product label.
- C. Surface Grade
1. Remove weeds, debris, clods and rocks larger than ½". Dispose of accumulated debris at direction of owner or owner's representative.
- D. Runoff
1. Take measures and furnish equipment and labor necessary to control the flow, drainage, and accumulation of water. Insure that all water will run off the grades.
- E. Erosion Control
1. Take measures and furnish equipment and labor necessary to control and prevent soil erosion, blowing soil and accumulation of wind-deposited material on the site throughout duration of work.

3.03 INSTALLATION

- A. Soil Amendment
1. Evenly distribute soil amendments, conditioners, and fertilizer, and first application of fertilizer in landscaped areas at the rates outlined in Part 2.01 of this Section.
- B. Seconds and Subsequent Fertilizer Application
1. At the time of sodding and sports field turf seeding and every 45 days thereafter until acceptance of project by Owner, apply 1 lb. of nitrogen or 5 lbs. of fertilizer material per 1,000 sq. ft. using 20-10-5 with 50% sulfur coated urea to all sod and sports field turf seed areas.
- C. Mixing
1. After applying soil conditioner, sulphur, and first application of fertilizer, thoroughly till area to depth of 6" minimum by plowing, harrowing, or disking until soil is well pulverized and thoroughly mixed.
- D. Fine Grading in all Landscape Areas:
1. Do fine grading for areas prior to planting.
 2. For ground surface areas surrounding buildings to be landscaped, maintain required positive drainage away from buildings.
 3. Establish finish grades to within 0.04 foot of grades indicated.
 4. Fine grading must be inspected and approved by owner's representative.
 5. Any damage caused by inclement weather, to finish grades before inspection, will be repaired by the contractor, prior to acceptance by owner's representative.
 6. Sodded areas - Allow 1" for sod.
- E. Noxious weeds or parts thereof shall not be present in the surface grade prior to landscaping.
- F. Prior to acceptance of grades, hand rake to smooth, even surface free of debris, clods, rocks, and vegetable matter greater than ½".

3.04 FIELD QUALITY CONTROL

- A. Inspection
 - 1. Provide notice to Owner's representative requesting inspection at least seven (7) calendar days prior to anticipated date of completion.
 - 2. The following required inspections will be conducted to ensure proper preparation of soil, prior to planting.
 - (a) During, or after, the first cultivation
 - (b) After the application of specified soil amendments.
 - (c) During, or after, the second cultivation
 - (d) After the final grades have been established
- B. Deficiencies
Owner's representative will specify deficiencies to Contractor who shall make satisfactory adjustments and shall again notify Owner's representative for final inspection.

3.05 CLEANING
Remove debris and excess materials from site. Clean out drainage inlet structures. Clean paved and finished surfaces soiled as a result of work under this Section, in accordance with direction given by Owner's representative.

3.06 PROTECTION
Provide and install barriers as required and as directed by Owner's representative to protect completed areas against damage from pedestrian and vehicular traffic until acceptance by Owner. Contractor is not responsible for malicious destruction caused by Others.

END OF SECTION

DIVISION 03

CONCRETE

SECTION 031000

CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

Provide all formwork for cast in place concrete shown on the Drawings and specified herein.

1.02 RELATED SECTIONS

- A. Earthwork Section 02200
- B. Concrete Pavement & Improvements Section 02510
- C. Landscaping Section 02900

1.03 QUALITY ASSURANCE

- A. Standards Formwork must comply with requirements of ACI 347 68 Recommended Practices for Concrete Formwork, except as may be otherwise shown or noted on the Drawings or herein specified.
- B. Qualifications for Project Manager of Applicator Minimum 2 years experience on comparable formwork projects.
- C. Regulations Perform all work in accordance with the local building codes and other applicable regulations.

PART 2 - PRODUCTS

2.01 FORMS

- A. Forms for Exposed Finish Concrete shall be new plywood or other panel type material acceptable to the Owner's Representative. All formwork shall provide continuous, straight and smooth as cast surfaces.
- B. Unless otherwise shown or specified, construct formwork for exposed concrete surfaces with plywood, metal, metal framed, plywood faced or other panel type materials acceptable to the Owner's representative, to provide continuous, straight, smooth as cast surfaces.
- C. Use overlaid plywood complying with U.S. Product Standard PS 1, "B B Medium Density Overlaid Concrete Form", Class I.
- D. Forms for Unexposed Finish Concrete Form concrete surfaces which will be unexposed in the finished structure with plywood, lumber, metal, or other acceptable material. Provide lumber that is dressed on at least two edges and one side for tight fit.
- E. Form Ties Breakback type as approved. For exposed work use approved size cone ties.
- F. Inserts Suitable for intended use as approved.
- G. Form Voids "Verticell", or approved equal, 4" height by grade beam width.
- H. Footing Forms If allowed by the soils engineer and local codes, concrete footings may be poured in neat earth cut trenches without the use of extraneous side forms.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Inspect surfaces to receive flatwork concrete for conformance to earthwork tolerances specified.
- B. Do fine hand grading as required to assure minimum thickness of concrete as indicated. Be sure any required gravel sub grade or drainage system is in place.

3.02 DESIGN OF FORMWORK

- A. Design, erect, support, brace, and maintain formwork so that it will safely support vertical and lateral loads that might be applied, until such loads can be supported by the concrete structure.
- B. Design formwork to be readily removable without impact, shock or damage to cast in place concrete surfaces and adjacent materials.
- C. Provide formwork sufficiently tight to prevent leakage of cement paste during concrete placement. Solidly butt joints and provide backup material at joints as required to prevent leakage and fins.

3.03 FORM CONSTRUCTION

- A. Construct forms complying with ACI 347, to the exact sizes and shapes, lines and dimensions shown, and as required to obtain accurate alignment, location, grades, level and plumb work in finished structures.
- B. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages, and inserts and other features required.
- C. Use selected materials to obtain required finishes. For exposed work, space cone ties in accurate alignment spaced 16" o.c. both horizontally and vertically unless shown otherwise.
- D. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
- E. Form intersecting planes to provide true, clean cut corners, with edge grain of plywood not exposed as form for concrete.
- F. Provide openings in forms to accommodate other work, including mechanical and electrical work. Accurately place and securely support items required to be built into the forms.
- G. Provide shoring and reshoring system for proper, safe, structurally sound construction.

3.04 CLEANING AND TIGHTENING

Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt and other debris just before concrete is to be placed. Retighten forms immediately after concrete placement as required to eliminate mortar leaks.

3.05 FORM COATINGS

Coat form contact surfaces with form coating compound before reinforcement is placed.

3.06 REMOVAL OF FORMS

Remove forms in accordance with ANCI 347 68. Forms shall not be disturbed for a minimum of twenty four hours after pouring.

3.07 REUSE OF FORMS

Clean and repair surface of forms to be re used in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound on reused forms.

END OF SECTION

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

- A. This section specifies cast-in-place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.
- B. Cast-in-place concrete includes the following.
 - 1. Footings and foundations
 - 2. Slabs-on-grade
 - 3. Foundation walls and pedestals
 - 4. Miscellaneous concrete

1.02 RELATED SECTIONS

- A. Concrete Formwork Section
- B. Earthwork Section

1.03 QUALITY ASSURANCE

- A. Conform to applicable codes and standards including but not limited to the following except as herein modified:
 - 1. ACI 301 Specifications for Structural Concrete for Buildings ACI 304 Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
 - 2. ACI 305 Hot Weather Concreting.
 - 3. ACI 306 Cold Weather Concreting.
 - 4. ASTM C94 Specification for Ready Mixed Concrete
 - 5. ACI 318 Building Code Requirements for Reinforced Concrete

1.04 TOLERANCES

- A. Flatwork: Tops of footings, piers and pad shall not be out of level more than 1/4" in 10' above or below elevation(s) shown. Slabs, floors, ramps, platforms, aprons and walks shall not be out of level more than 1/8" in 10' above or below the elevation shown.
- B. Notification: The contractor shall notify the Owner's representative a minimum of 48 hours before pouring any footings, walls and/or slabs. Concrete shall not be placed until forming, reinforcing, piping and conduit have been observed and approved by the Owner's representative.

1.05 SUBMITTALS

- A. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, vapor barriers, joint systems, curing compounds, and others as requested by the Owner's Representative.
- B. Shop drawings for reinforcement prepared by competent structural detailer/draftsman for fabrication, bending, and placement of concrete reinforcement. Comply with ACI SP-66 (88), "ACI Detailing Manual," showing placement plan, sections, elevations, bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
- C. Laboratory test reports for concrete materials and mix design tests.
- D. Materials certificates in lieu of materials laboratory test reports when permitted by Owner's

Representative. Materials certificates shall be signed by manufacturer certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

1.06 GUARANTEE

- A. The contractor shall guarantee all work performed for a period of (1) one year following the date of acceptance of the entire project by the Owner. Repairs made during the guarantee period shall be done in a manner acceptable to the Owner and at the contractors expense.

PART 2 - PRODUCTS

2.01 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- C. Welded Wire Fabric: ASTM A 185
- D. Supports for Reinforcement: Bolsters, chair spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire-bar-type supports complying with CRSI specifications.
 - 1. For exposed to view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

2.02 CONCRETE MATERIALS

- A. Portland Cement Conform to ASTM C150, Type II: Use one brand of cement throughout project, unless otherwise acceptable by the Owner's Representative.
- B. Fly Ash: ASTM C 618, Type C or Type F
 - 1. Limit use of fly ash to not exceed 15% of cement content by weight.
- C. Aggregates Conform to ASTM C33.
- D. Coarse Aggregates Graded, washed, crushed gravel free of deleterious substances, maximum size for members within minimum dimension greater than 12", shall be 1 2". For members with minimum dimension of 12" or less maximum size shall be 3/4".
- E. Normal Weight Aggregates: ASTM C 33 and herein specified. Provide aggregates from a single source for exposed concrete.
 - 1. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.
 - 2. Local aggregates not complying with ASTM C 33 but that special tests or actual service have shown to produce concrete of adequate strength and durability may be used when acceptable to the Owner's Representative.
- F. Water Clean, fresh, potable.
- G. Expansion Joint Material 2" thick asphaltic material, complying with ASTM D1751.
- H. Dowels for connecting new concrete walk to existing walk, for expansion joints in new concrete walks, and for connecting top of stair and bottom of stair to new concrete walks shall be #4 rebar, deformed billet steel, meeting ASTM A 615 74, grade 60. They shall be clean, new, and free of rust.
- I. Surface Sealer All vertical concrete surfaces exposed to view shall receive a 2 coat application of liquid sealer. The liquid sealer shall be water clear and after application, shall be invisible and

neither strain nor discolor the surface. It shall be penetrating, non silicone solution such as "Chemstop" by Chemstop Manufacturing Corporation of Bellflower, California: "Canyon Tone Clear" by United Coating of Spokane, Washington: or Sure Klean "Weather Seal 209" by ProSoCo, Inc. or Kansas City, Kansas.

2.03 CONCRETE ADMIXTURES:

- A. Fiber Reinforcement - Fibermesh, available from Fibermesh Co., Highlands Ranch, CO, 303-973-0888, or approved equal. Rate is to be 1.5 lbs. Per cubic yard.
- B. Air Entrainment ASTM C260
- C. Water reducing Admixture ASTM C494, Type A may be used but not to reduce minimum cement requirement.
- D. Calcium Chloride: Use is prohibited.

2.04 CURING MATERIALS:

- A. Curing compound shall be approved white product made for this purpose, PROTEX or approved equal, meeting ASTM M148 60.
- B. Exterior Flatwork Protex Promulsion 200 or approved equal.
- C. Liquid Curing Hardening Compound Protex Triple Seal or approved equal.

2.05 BONDING AGENT:

Chemical or epoxy type, as approved, suited to application.

2.06 CONCRETE MIXES:

- A. Determining Proportions The proportions of cement aggregate and water to produce the specified concrete strength shall meet the requirements specified in this section with final proportion determined in accordance with ACI 318, Chapter 4 "Concrete Quality", but in no case less than what is specified within the Section. If strength tests are used to verify a previous concrete mix design, the tests shall be within the last nine (9) months and shall be of the same materials proposed for use. All costs required for determining the concrete mix design shall be paid by the contractor. All mixes used shall have been determined by an independent laboratory (not a concrete manufacturer).
- B. Substitutions No substitutions shall be made in the materials used in the concrete mix without additional testing to verify that the quality of the concrete has not been affected.
- C. Basic Concrete Mix Requirements The Final proportioning used to obtain the specified strengths shall not be less than the minimum or greater than the maximum requirements specified in the following table:

Compressive Strength at 28 days	Slump	Air Content (%)
4,000 psi	2-4"	5-8%

PART 3 - EXECUTION

3.01 CONCRETE MIXING AND DELIVERY:

- A. Furnish ready mixed concrete mixed and delivered per ASTM C94. When concrete is mixed in the truck mixer, do not load over NRMCA rated capacity, mix at mixing speed for not less than 70, nor more than 100 revolutions of drum or blades.
- B. Concrete used for walks shall contain at least 6.0 sacks of cement per cubic yard and 5-8%

entrained air.

- C. Deliver concrete to the job and discharge entire contents within 1 1/2 hours, or before drum has turned 300 revolutions, whichever occurs first, after introduction of mixing water. In hot weather, or under conditions contributing to quick set of concrete, shorter times may be required by the Owner's representative.
- D. Add no water at the job site.
- E. During cold weather (below 45 degrees F.), concrete temperature shall be: within 50 degrees and 90 degrees F. Use heated water and, if necessary, heated aggregates to meet this requirement.

3.02 CONCRETE PLACEMENT:

- A. Convey, place and consolidate concrete in compliance with the practices and recommendations of ACI 304, and as herein specified. Provide expansion joints using expansion joint material located as indicated and approved with a maximum of 100 ft. on center. Provide handtooled divider joints a minimum of 1 3/4" deep as indicated for exterior work. If not shown, locate on not more than 8 ft. centers and/or as approved. Provide sawcut divider joints for court paving area.
- B. Notify the Owner's representative not less than 8 working hours in advance of any pour and as soon as formwork and reinforcing are substantially complete.
- C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, provide construction joints as herein specified. Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic. Deposit concrete as nearly as practicable to its final location to avoid segregation due to rehandling or flowing.
- D. Do not subject concrete to any procedure which will cause segregation.
- E. Screed concrete which is to receive other construction to the proper level to avoid excessive skimming or grouting.
- F. Do not use concrete which becomes non plastic and unworkable, or does not meet the required quality control limits, or which has been contaminated by foreign materials. Do not use retempered concrete.
- G. Remove rejected concrete from the project site and dispose of it in an acceptable location.
- H. Remove temporary spreaders in forms when concrete placing has reached the elevation of such spreaders.
- I. Isolate flatwork from walls, columns, bollards, and all other vertical elements with expansion joints unless otherwise indicated.
- J. Saw cutting of divider joints shall be used provided cutting occurs as soon as it can be done without dislodging coarse aggregate and before initial shrinkage stresses have occurred.
- K. Consolidation Consolidate concrete placed in forms by mechanical vibrating equipment supplemented by hand spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with the recommended practices of ACI 309, to suit the type of concrete and project conditions. Vibration of forms and reinforcing will not be permitted, unless otherwise accepted by the Owner's representative.
- L. Bring slab surfaces to the correct level with a straight edge and strike off. Use bull floats or darbies to smooth the surfaces prior to beginning finishing operations.

- M. Maintain reinforcing steel in the proper position continuously during concrete placement operations.
- N. Bonding Roughen surfaces of set concrete at all joints, except where bonding is obtained by use of a concrete bonding agent, and clean surfaces of laitance, coatings, loose particles, and foreign matter. Roughen surfaces in a manner to expose bonded aggregate uniformly and to not leave laitance, loose particles or aggregate, or damaged concrete at the surface.
- O. Cold Weather Placement Protect all concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures in compliance with the requirements of ACI 306. (min. 50 degrees F for 7 days) Do not use frozen concrete. Remove from the site immediately.
- P. Hot Weather Placement When hot weather conditions exist that would seriously impair the quality and strength of concrete, place concrete in compliance with ACI 305.

3.03 FINISHING:

- A. Rough Form Finish Standard rough form finish shall be the concrete surface having the texture imparted by the form facing material used, with tie holes and defective areas repaired and patch and all fins and other projections exceeding 1/4" in height rubbed down or chipped off.
- B. Non slip Medium Broom Finish Apply non slip broom finish to exterior concrete flatwork platforms, steps and ramps, and elsewhere as shown on the drawings and details. Use 2" tooled edges on all concrete flatwork edges.
- C. Immediately after trowel finishing, slightly roughen the concrete surface by brooming in the direction perpendicular to the main traffic route. Use fiber bristle broom unless otherwise directed. Coordinate the required final finish with the Owner's representative before application.
- D. Unspecified Finish Where the finish is not designated in the contract documents, the following finishes shall be used:
 - 1. Rough Form Finish for all concrete surfaces not exposed to public view
 - 2. Non slip Medium Broom Finish for all concrete surfaces exposed to public view.

3.04 CONCRETE CURING AND PROTECTION:

- A. General Protect freshly placed concrete from premature drying and excessive cold and hot temperature, and maintain without drying at a relatively constant temperature for the period of time necessary for hydration of the cement and proper hardening of the concrete.
- B. Start initial curing as soon as free moisture has disappeared from the concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 72 hours.
- C. Begin final curing procedures immediately following initial curing and before the concrete has dried. Continue final curing for at least 7 days and in accordance with ACI 301 procedures. Avoid rapid drying at the end of the final curing period.
- D. Curing Methods Provide white pigmented liquid membrane curing as follows: Apply the specified membrane forming curing compound to damp concrete surfaces as soon as the water film has disappeared. Apply uniformly by spray equipment in accordance with the manufacturer's directions. Maintain the continuity of the coating and repair damage to the coat during the entire curing period.
- E. Do not use membrane curing compounds on surfaces which are to be covered with additional asphalt setting bed and decorative pavers. Verify compatibility with other finishes or their adhesives.

3.05 TESTING:

- A. Concrete materials and operations will be tested and inspected as work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection when such defect is discovered nor shall it obligate the Owner's representative for final acceptance.
- B. The Owner may authorize test cylinders of concrete, these samples to be analyzed by an independent laboratory, selected by the Owner to prove compliance with these specifications. The Contractor is to furnish samples at no cost. The Owner will pay for the initial testing. Re testing required due to failure of the initial test is to be paid for by the contractor.
- C. Tolerances Slabs and finished surfaces shall be in a plane, pitched and sloped as shown on the drawings within a finish tolerance 1/4" in 10' for concrete. Pockets on slabs and finished surfaces which hold water after construction will be cause for rejection of the slab.
- D. Layout Lines and Levels Before paving or forming operations commence, the site shall be substantially staked out for the work of this section for the Owner's representatives approval.
- E. Grade and layout stakes shall be set at 40' intervals along walk and as shown on the drawings and details.
- F. Strength Tests Conduct strength test of the concrete during construction in accordance with the following procedures unless revised at the direction of the Owner or Owner's representative.
- G. Secure composite samples in accordance with "Method of Sampling Fresh Concrete", ASTM C 172. Each sample shall be obtained from a different batch of concrete on a random basis. Avoiding any selection of the test batch other than by a number selected at random before commencement of concrete placement.
- H. Mold and cure six specimens from each sample in accordance with the "Method of Making and Curing Concrete Compression and Flexural Specimens in the Field", ASTM # 31. Any deviations from the requirements of this Standard shall be recorded in the test support.
- I. Test specimens in accordance with "Method of Test for Compressive Strength of Molded Concrete Cylinders", ASTM C 39. Three specimens shall be tested at 7 days for information and two shall be tested a 28 days for acceptance. Specimens not tested shall be held 45 days and either tested or discarded as directed.
- J. Determine slump of the concrete sample for each strength test and whenever consistency of concrete appears to vary, using "Method of Test for Slump of Portland Cement Concrete", ASTM C 143.
- K. Determine air content of normal weight concrete sample for each strength test in accordance with either ASTM C 231 and ASTM C 173 or ASTM C 138 method.
- L. Determine air content and unit weight of lightweight concrete sample for each strength test in accordance with ASTM C 173 and ASTM C 567.
- M. The contractor shall submit to the Owner and Owner's representative the concrete material tests and the concrete mix designs proposed for use with a written request for approval. This submittal shall include the results of all testing performed to qualify the materials and the mix designs. No concrete shall be placed in the work until the Contractor has received such approval in writing.
- N. Report all test results to the Owner and Owner's representative not later than the following day after tests are made.

3.06 EVALUATION OF CONCRETE STRENGTH:

- A. Strengths of concrete shall be considered satisfactory if the average of any three consecutive strength tests of the laboratory cured specimens representing each specified strength of concrete is equal to or greater than the specified strength, or if test cylinders taken are equal to or greater

than the specified strength.

- B. Concrete Compressive Strength If the concrete fails to meet the compressive strength requirements, additional curing may be required and modifications may be required in the concrete mix design for the remaining concrete work. Replace concrete already in place that fails to meet strength requirements.

END OF SECTION