1.1 Drawings

1.1.1 Midrise Apartments

We reviewed the architectural drawings for the BD1 and BD2 midrise apartment buildings dated 22 November 2004 and issued by Minno & Wasko. The drawings are not stamped, and do not include notation to indicate the design phase. We also received the architectural drawings for the BD3 midrise apartment building dated 25 June 2001, which are the same as BD1 and BD2 drawings. We did not receive drawings for the BD4 buildings, but understand that the drawings are exactly the same as the drawings we reviewed.

Below is a summary of information from the drawings pertinent to our discussion. Details are included in Appendix A.

- Detail 4/D-1: Typical roof assembly is shown with the following materials listed from exterior to interior: Modified bitumen roofing, tapered insulation, 5/8 in. T&G plywood sheathing, wood trusses, R-30 batt insulation (faced with V.B.), 1/2 in. channels, 5/8 in. type X gypsum wallboard. This detail also shows intended roof slope of 1/4 in. per foot to drain.

- Detail 3/D-1: Typical EIFS wall assembly is shown with the following materials listed from exterior to interior: EIFS drainage system per manufacturer specifications, 2 in. min. insulation, backstop air/weather barrier, 1/2 in. CDX plywood, 2x6 wood stud framing, R-19 batt insulation with V.B. at heated side, 5/8 in. type X gypsum wall board. This detail also shows 3/4 in. wide horizontal expansion joint show at center of floor joints.

- Detail 2/D-1: Typical brick wall assembly at first floor is shown with the following materials listed from exterior to interior: 4 in. brick veneer, 1 in. air space, galvanized metal ties, 16 in. concrete wall. The detail also shows metal through wall flashing at the base of the EIFS cladding, with weather barrier lapped over the vertical leg 6 in. minimum.

- Detail 2/D-3: Typical terrace waterproofing assembly is Duradek waterproofing system on concrete deck sloped 1/4 in. per foot. Base flashing extends minimum 4 in. up exterior wall, and a note states to provide metal flashing at wall/slab intersection. This detail shows EIFS terminating 4 in. above terrace surface.

- Detail 6/D-3: Typical balcony fascia assembly is shown as EIFS finish with reinforcing mesh, 1 in. thick insulation, 5/8 in. Dens Glass Gold sheathing, and P.T. blocking. The Duradek waterproofing system laps over a continuous metal drip edge at the balcony perimeter.

- Detail 8/D-3: Typical balcony waterproofing membrane is Duradek waterproofing system over plywood deck sloped 1/4 in. per foot. Base flashing extends minimum 6 in. up the exterior wall, and is overlapped with wall weather barrier. A note states to provide bent metal at deck/wall intersection with a minimum leg of 4 in. This detail shows EIFS terminating 4 in. above balcony surface.

- Detail 9/D-3: Typical standing seam metal roof assembly includes the following materials listed from exterior to interior: “dutch seam” metal roof, 30 pound building felt with paper slip sheet and vapor barrier, 5/8 in. CDX plywood on wood trusses.

- Detail 10/D-3: Typical railing attachment includes a note to set base plate in caulk prior to screw attachment, and set all screws in caulk prior to penetrating waterproof membrane.

- Detail 13 and 14/D-3: Show detailing at PTAC penetration through brick and EIFS cladding. Through-wall flashing shown above PTAC with drip edge extending beyond face of unit in both details. Details do not show how WRB or membrane integrates with PTAC.

- Detail 1 and 11/D-4: Show window sill detail at EIFS clad walls. No sill flashing is shown.

- Detail 6 and 16/D-4: Show window sill detail at brick clad walls. Membrane sill flashing laps over through-wall flashing that is sloped to the exterior and extends beyond the face of brick.

- Detail 2, 7, 12 and 17/D-4: Show window jamb detail at EIFS and brick clad walls. Details do not call out jamb flashing that wraps to opening.

- Detail 3 and 13/D-4: Show window head detail at EIFS clad walls. No head flashing is shown.

- Detail 8 and 18/D-4: Show window head detail at brick clad walls. Head flashing and weeps are called out.

1.1.2 Townhouse Drawings

We reviewed architectural drawings for the townhouse apartment buildings dated 24 September 2004 and issued by Minno & Wasko. The drawings are issued for permit and are stamped with the initials “GPH”, though because it is a photocopy, the stamp is unclear.

Below is a summary of information from the drawings pertinent to our discussion. Specific details are included in Appendix B.

- Detail 1/D-1: Typical brick clad wall assembly is shown with the following materials listed from exterior to interior: 4 in. brick veneer, 1 in. nominal air space, galvanized metal ties at 16 in. o.c., 15 pound impregnated felt, 7/16 in. OSB sheathing, 2x wood stud framing, batt insulation with V.B. at heated side (R-15 at 2x4, R-19 at 2x6), 5/8 in. type X gypsum wall board. This detail shows continuous through-wall flashing extending beyond the exterior face of masonry, with weeps at 32 in. o.c. The wall weather barrier laps over the vertical leg of through-wall flashing 6 in. minimum.

- Detail 3/D-1: Continuous aluminum cleats are fastened at 8 in. o.c. on either side of the coping to secure the coping.

- Detail 4/D-1: Typical roof assembly is shown with the following materials listed from exterior to interior: Modified bitumen roofing, 5/8 in. T&G plywood sheathing, wood trusses, R-30 batt insulation (faced with V.B.), 1/2 in. channels, 5/8 in. type X gypsum wallboard. This detail also shows intended roof slope of 1/2 in. per foot to drain.

Commented [CMS1]: See PL3 NLRUR 003248

- Detail 25/D-1: Typical standing seam metal roof assembly is shown with the following materials listed from exterior to interior: Standing seam copper roofing, building paper, elastomeric ice and water shield, 1/2 in. sheathing, roof rafters and framing. This detail shows copper through-wall flashing that extends from the backup wall, through a mortar joint, and counterflashes the copper roofing.

- Detail 12/D-2: Typical deck assembly is shown with the following materials listed from top to bottom: Duradek glued to deck with approved adhesive, 3/4 in. T&G plywood over ripped 2x to provide 1/4 in. per foot slope, 3/4 in. plywood over 2x joists, beaded soffit. This detail shows the Duradek membrane turning down over the deck edge. A note is provided on this detail to continue Duradek through brick veneer and 6 in. minimum up exterior sheathing of wall.

- No window, door or penetrations details are provided in this drawing set.

- Details 20 and 21/SD-1: Structural details to show typical exterior stair construction, but do not include make-up of cheek walls.

- Details 22 and 28/SD-2: Structural details show typical bay window construction, but do not include full make-up of assembly.

1.2 Specifications

We received two sets of specifications prepared by Minno & Wasko.

- Phase 3A.2 Specifications dated 12 March 2004.
  - Includes BD3 & BD4 Building Garden Apartments (Midrise apartments).
  - Includes Townhouse Block No. 3, 4 & 5.
- Phase IIID Specifications dated 24 September 2004.
  - Includes Townhouse Block No. 1, 2, 3, and 4.

We did not receive specifications for buildings BD1 and BD2, but assume they are the same as buildings BD3 and BD4. Below we summarize our review of information from the specifications pertinent to our discussion. Specific sections are included in Appendix C.

1.2.1 Phase 3A.2 Specifications dated 12 March 2004

Individual sections have revision dates of either 5 August 2002 or 12 March 2004. We note the revision date in brackets for each section below. No window specification section is included.

<u>Section 01040 Coordination (5 August 2002)</u>

- 01040.1.4.A- “Coordination Drawings: Prepare coordination drawing where careful coordination is needed for installation of products and materials fabricated by separate entities…”

- 01040.3.1.A- “Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.”

Sections 01200 Project Meetings (5 August 2002):

- “Schedule a preconstruction conference before starting construction, at a time convenient to the Owner and the Architect … Conduct the meeting to review responsibilities and personnel assignments.”

- “Attendees: Authorized representatives of the Owner, Architect, and their consultants; the Contractor and its surperintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conferece. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.”

- “Agenda: Discuss items of significance that could affect progress, including the following”

  - Tentative construction sechedule.
  - Critical work sequencing.
  - Designation of responsible personnel.
  - Procedures for processing field decisions and Change Orders.
  - Procedures for processing Applications for Payment.
  - Distribution of Contract Documents.
  - Submittal of Shop Drawings, Product Data, and Samples.
  - Preparation of record documents.
  - …”

- “Progress Meetings: Conduct progress meetings at the Project Site at regular intervals. Notify the Owner and the Architect of scheduled meeting dates.”

Section 01300 Submittals (12 March 2004)

- “This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following: contractor’s construction schedule, submittal schedule, construction reports, shop drawings, product data, samples, and quality assurance submittals.”

- "Coordination Drawings show the relationship and integrations of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended."

- "Mock-ups are full-size assemblies for review of construction, coordination, testing, or operation; they are not Samples."

- "Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents…"

- Product Data: include manufacturer's printed recommendations, compliance with trade association standards, compliance with recognized testing agency standards, application of testing agency labels and seals, notation of dimensions verified by field measurement, and notation of coordination requirements.

- Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications

Section 01410 Quality Control and Testing Laboratory Services (5 August 2002)

- "If any discrepancies or conflicts arise between the drawings and other drawings, as well as with the specifications, the contractor must notify the Architect and Owner do they can determine the correct scope of work."

- Quality Assurance: Standards: ASTM, AWS, AISC, SSPC, ACI

Section 01421 Reference Standards and Definitions (5 August 2002)

- Industry Standards: Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- Conflicting Requirements: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different but apparently equal to the Architect for a decision before proceeding.

- Copies of Standards: Each entity engaged in construction on the Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

Section 03450 Architectural Precast Concrete (5 August 2002)

- Architectural Precast Concrete Applications: copings, string courses and sills.

- Quality Assurance Standards: ACI 318, Building Code Requirements for Reinforced Concrete; CRSI Manual of Standard Practice; PCI MNL 117, Manual for Quality Control for Plants and Production of Architected Precast Concrete Products

- Mock-Ups: Full-size typical unit

Section 04200 Unit Masonry (12 March 2004)

- Unit Masonry Construction: brick veneer cavity wall on wood studs, brick and concrete block composite walls, brick and concrete block cavity walls, concrete block bearing walls and non-bearing partitions, precast concrete trim built into masonry walls, and freestanding site masonry walls.

- Standards: ACI 530.1, Specifications for Masonry Structures

- Field-Constructed Mock-Up: Typical exterior masonry construction

- Concrete Building Brick: ASTM C 55

- Masonry Accessories: nonmetallic expansion joint strips, preformed control joint gaskets, bond breaker strips, plastic tubing for weeps, cotton sash cord for weeps, and open head-joint weeps.

Section 06100 Rough Carpentry (5 August 2002)

- Rough Carpentry: framing with dimension lumber, framing with engineered wood products, rooftop equipment bases and support curbs, wood grounds, nailers, blocking, wood furring, backing panels, sheathing, subflooring, underlayment, air infiltration barrier.

- Boards: Exposed and Concealed Boards: 19 percent moisture content.

- Miscellaneous Lumber: Moisture Content: 19 percent.

- Wall and Roof Sheathing: APA Sheathing, Exposure 1

- Auxiliary Materials: Air Infiltration Barrier: Woven polyefin sheet.

Section 07185 Traffic Membrane (5 August 2002)

- Project includes traffic membrane consisting of welded seam PVC waterproofing, over the balcony decks and roof decks.

- References: ICBO-Acceptance Criteria for Walking Decks; ICBO Evaluation Service, Inc. (ICBO-ES)

- Submittals:

- Product Data: Manufacturer's specifications, including data substantiating compliance with physical properties specified.
- Shop Drawings: Installation and seaming plan, showing joints, termination details, and interface with other materials.
- Manufacturer's printed installation instructions and recommendations, including precautions required for seaming and adhering membrane.

- Quality Assurance: Pre-installation Meeting: Discuss waterproofing practices and precautions applicable to this project and require attendance of manufacturer's representative, contractor's field superintendent, installation foreman, other trades affected by this work, and owner's representative.
- Materials:
  - Traffic Membrane: Ensurco Duradek Ultra; polyester reinforced PVC membrane with ultra-violet resistance, for fully-adhered installation with heat-welded seamed and perimeter attachment.
  - Surface Conditioner, Adhesives, Sealant, Fillers, and Cleaners: As specified or provided by membrane manufacturer.
  - Perimeter Fasteners: Mechanical fastening devices furnished by membrane manufacturer.
  - PVC Coated Metal, Scuppers, Overflow Drains, Roof Drains, and Trims furnished by membrane manufacturer.
  - Adjacent Flashings: Specified in other sections; installed by others.
- Execution:
  - Examination: Verify that deck is clean smooth, free of depressions, waves, and projections, properly sloped to drains, valleys, or eaves. Notify the Architect of any conditions that would prevent satisfactory completion of the work. Do not proceed until unsatisfactory conditions are corrected.
  - Installation: Install membrane with minimum number of seams possible. Overlap seams 3/4 in. to shed water; heat-weld all seams. Adhere membrane to substrate. Mechanically fasten all perimeter edges and penetrations. Install flashing and accessories. Seal around all penetrations, drains, and edges.

<u>Section 07240 Exterior Insulation and Finish Systems (5 August 2002)</u>

- Project includes applications over concrete, masonry, and gypsum sheathing.
- Quality Assurance:

- Pre-construction conference.
- Field-Constructed Mock-Up: Typical panel.
- Third-party inspection at integral stages of project.
- Shop drawings and detail submittal.

- Product: Senergy: Senterion System III.

Section 07526 Modified Bituminous Sheet Roofing (5 August 2002)

- Project includes modified bituminous roofing system and roof insulation.
- Quality Assurance: UL Class A external fire exposure, and Class 90 wind-uplift requirements and FM Class I construction.
- Warranty: Roofing Warranty: Manufacturer's 15 year warranty.
- Products:
  - Bituminous Sheet Roofing: GAF Materials Corporation 1-2-1-TGP; Schuller 2CIN-W; Celotex APP-4-W-M
  - Auxiliary Materials: Sheet Metal Accessories: SMACNA and MRCA recommendations.

Section 07600 Flashing and Sheet Metal (5 August 2002)

- Flashing and Sheet Metal: metal counterflashing and base flashing; exterior wall flashing and expansion joints; built-in metal valleys, gutters, and scuppers; gutters and downspouts; exposed metal trim and fascia units; elastic flashing, elastic roof and wall expansion joint systems; laminated composition flashing; sheet metal accessories
- Products:
  - Flexible Sheet Membrane Flashing: Nonreinforced flexible black elastic sheet, 50 to 65 mils thick, EPDM synthetic rubber sheet
  - Fabricated Units: Compliance with SMACNA Architectural Sheet Metal Manual
  - Elastic Expansion Joints: Factory-fabricated metal-flanged edges to fit curbs and curb substrate
  - Auxiliary Materials: solder compatible with metal; bituminous isolation coating; mastic and elastomeric sealants; epoxy seam sealer; rosin-sized building paper slip sheet; polyethylene underlayment; reglets and metal accessories; gutter and conductor head guards; asphaltic roofing cement.

Section 07610 Sheet Metal Roofing (5 August 2002)

- Sheet Metal Roofing: standing-seam type.
- Quality Assurance:
  - Shop drawing submittal including trim and flashing.
  - Field-Constructed Mock-Up: Typical area.
  - Follow manufacturer's standards and architectural sheet metal manual.
- Auxiliary Materials: Vapor Retarder Underlayments- "Griffolyn T-65"; Paper slip sheet on 30 pound building felt; bituminous isolation coating; batten bars and strips; snow guards; snow gutters

Section 07710 Manufactured Roof Specialties (5 August 2002)

- Prefabricated Roof Specialties: fascia systems, fascia batten and panel systems, fascia system for built-up roofing, fascia system for single-ply roofing, fascia and gravel stop systems, fascia panel support systems, and aluminum copings.
- Quality Assurance: FM approval or acceptance.
- Products:
  - Fascia Systems: Standard modular panels, trim, closuere strips, and accessories.
  - Aluminum Copings: Interlocking multi-part coping system, 0.063 in. thick alumni sheet, 24 gauge zinc-coated steel anchor plate, and formed aluminum gutter,
  - Elastic Roof Expansion Joint Covers: Metal flanged elastic-sheet bellows-type joint system, membrane, and metal flanges compatible with substrate.

1.2.2 Phase IIID Specifications dated 15 September 2004

The individual sections include revision dates 15 September 2004 with the exception of Divisions 15 and 16 which are dated 24 September 2004. No window specification section is included.

Section 03450 Architectural Precast Concrete

- Architectural Precast Concrete Applications: copings, string courses and sills.
- Quality Assurance Standards: ACI 318, Building Code Requirements for Reinforced Concrete; CRSI Manual of Standard Practice; PCI MNL 117, Manual for Quality Control for Plants and Production of Architected Precast Concrete Products
- Mock-Ups: Full-size typical unit

- **Reinforcing Materials: 2. Reinforcing shall be galvanized or epoxy coated when covered with less than 1-1/2 in. of material**.

Section 04200 Unit Masonry

- **Unit Masonry Construction: brick veneer cavity wall on wood studs, precast concrete trim built into masonry walls, and freestanding site masonry walls.**
- Standards: ACI 530.1, Specifications for Masonry Structures.
- Field-Constructed Mock-Up: Typical exterior masonry construction.
- Masonry Accessories: nonmetallic expansion joint strips, preformed control joint gaskets, bond breaker strips, plastic tubing for weeps, cotton sash cord for weeps, and open head-joint weeps, **"mortar net" or equal at weep hole locations**.

Section 06100 Rough Carpentry

- **Rough Carpentry: framing with dimension lumber, rooftop equipment bases and support curbs, wood grounds, nailers, blocking, wood furring, sheathing, subflooring, framing with engineered products.**
- **Miscellaneous Lumber: Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.**
- **Wall Sheathing: APA Rated Sheathing**
  - **Exposure Durability Classification: Exterior.**
- **Roof Sheathing: APA Rated Sheathing**
  - **Exposure Durability Classification: Exterior.**
- **Air Infiltration Barrier:**
  - **Asphalt-saturated organic felt complying with ASTM D226, Type I (No. 15 asphalt felt) unperforated.**
  - **Polyethylene sheet, 0.0061 inch thick, formed by spinning continuous strands of fine high density polyethylene interconnected fibers and bonding them together by heat and pressure; with a moisture vapor transmission rate of 400 grams/sq. meter/24 hrs. per ASTM E 96, procedure B; flame spread and smoke developed ratings of 5 and 10 per ASTM E 84.**
  - **Products: Subject to compliance with requirements, provide one of the following:**

- **"Barricade Building Wrap", Simplex Products Division, Anthony Industries, Inc.**
- **"Tyvek Housewrap", Fibers Department, Du Pont Company.**

- **Air Infiltration Barrier:**
  - **Cover sheathing with air infiltration barrier as follows:**
    - **Apply asphalt-saturated organic felt horizontally with 2-inch overlap and 6-inch end lap; fasten to sheathing with corrosion-resistant staples.**
    - **Apply plastic sheet to comply with manufacturer's printed directions.**
    - **Apply air infiltration barrier to cover upstanding flashing with 4-inch overlap.**

Section 07460 Fiber Cement Siding/Panels

- Furnish and install Hardiplank, Hardipanel and Hardishingle fiber-cement siding, Harditrim fascia and moldings and accessories where shown on drawings or specified herein.
- Coordinate this section with interfacing and adjoining work for proper sequence of installation.
- Install weather-resistive barriers and claddings to dry surfaces.
- Repair any punctures or tears in the weather-resistive barrier prior to the installation of the siding.
- Installation:
  - Install flashing around all wall openings.
  - Allow minimum 1 inch vertical clearance between roofing and bottom edge of siding.

Section 07526 Modified Bituminous Sheet Roofing

- Project includes modified bituminous roofing system and roof insulation.
- Quality Assurance: UL Class A external fire exposure, and Class 90 wind-uplift requirements and FM Class I construction.
- Warranty: Roofing Warranty: Manufacturer's 15 year warranty.
- **Products:**

- **GAF Materials Corporation N-1-2-TG**
- **Auxiliary Materials:**
  - **Vapor Retarder: Bituminous vapor retarder.**
  - **Insulation: Perlite board.**

Section 07570 Traffic Coatings

- **Waterproof, non-skid system at balconies and terraces**
- **Duradek Ultra 60 mil.**

Section 07600 Flashing and Sheet Metal

- Flashing and Sheet Metal: Metal counterflashing and base flashing; exterior wall flashing and expansion joints; built-in metal valleys, gutters and scuppers; gutters and downspouts; exposed metal trim and fascia units; elastic flashing; elastic roof and wall expansion joint systems; laminated composition flashing; sheet metal accessories.
- Products:
  - Flexible Sheet Membrane Flashing: Nonreinforced flexible black elastic sheet, 50 to 65 mils thick, EPDM synthetic rubber sheet
  - Fabricated Units: Compliance with SMACNA Architectural Sheet Metal Manual
  - Elastic Expansion Joints: Factory-fabricated metal-flanged edges to fit curbs and curb substrate
- Auxiliary Materials: solder compatible with metal; bituminous isolation coating; mastic and elastomeric sealants; epoxy seam sealer; rosin-sized building paper slip sheet; polyethylene underlayment; reglets and metal accessories; gutter and conductor head guards; asphaltic roofing cement.

Section 07610 Sheet Metal Roofing

- Sheet Metal Roofing: standing-seam type.
- Quality Assurance:
  - Shop drawing submittal including trim and flashing.
  - Field-Constructed Mock-Up: Typical area.
- Auxiliary Materials: Vapor Retarder Underlayments- “Griffolyn T-65”; Paper slip sheet on 30 pound building felt; bituminous isolation coating.