SECTION 03 06 00

CONCRETE ADMIXTURES

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\*\* NOTE TO SPECIFIER \*\* MAPEI; concrete admixtures.  
This section is based on the products of MAPEI, which is located at:  
1144 E. Newport Ctr. Dr.  
Deerfield Beach, FL 33442  
Toll Free Tel: 800-992-6273 -Floor Installation  
Email: [request info (jwhitfield@mapei.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=MAPEI&coid=33991&rep=&fax=&message=RE:%20Spec%20Question%20(03060mag):%20%20&mf=)  
Web: <https://www.mapei.com/us/en-us/home-page> | <https://www.mapei.com/ca/en-ca/home>   
 [ [Click Here](https://www.arcat.com/arcatcos/cos33/arc33991.html) ] for additional information.  
MAPEI markets concrete admixtures and auxiliary products for the concrete industry in the central United States. The company's products are routinely used to produce high-performance concrete mixes that are called upon to perform in all weather conditions. MAPEI continually incorporates the latest product technology available in its efforts to meet customer needs and is focused on continuing the development of next-generation chemical admixture products.  
Throughout all MAPEI's manufacturing processes for adhesives, sealants and other chemical products for the building industry, we have maintained a strong commitment to the environment and to sustainability. We work continuously to have all of our locations ISO 9001-certified for Quality Management and ISO 14001-certified for Environmental Management. We regularly review our product formulations against emerging technology and reformulate when appropriate to produce ever more environmentally friendly products.  
MAPEI is ready to meet its customers' needs with the best products, customer service and technical support in our market today and in the future.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Concrete admixtures and auxiliary products including the following:
       1. Accelerators.
       2. Air-entraining agents.
       3. Corrosion inhibitors.
       4. Masonry products.
       5. Retarders.
       6. Shrinkage reducer.
       7. Silica fume.
       8. Slump-retention admixture.
       9. Superplasticizers.
       10. Viscosity-modifying agents.
       11. Water reducers.
       12. Waterproofing admixtures.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03 30 00 - Cast-in-Place Concrete.
    2. Section 04 22 23.29 - Split-Face Concrete Unit Masonry.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Association of State Highway and Transportation Officials (AASHTO):
       1. AASHTO M194 - Standard Specification for Chemical Admixtures for Concrete.
       2. AASHTO M154 - Standard Specification for Air-Entraining Admixtures for Concrete.
       3. AASHTO M307 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
    2. American Society for Testing and Materials (ASTM):
       1. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
       2. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
       3. ASTM C157 - Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
       4. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
    3. NSF International. NSF/ANSI Standard 61: Drinking Water System Components - Health Effects.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Preparation instructions and recommendations.
        2. Storage and handling requirements and recommendations.
        3. Installation methods.
  2. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
     2. Installer Qualifications: Minimum 2 year experience installing similar products.
  3. PRE-INSTALLATION MEETINGS
     1. Convene minimum two weeks prior to starting work of this section.
  4. DELIVERY, STORAGE, AND HANDLING
     1. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
     2. Handling: Handle materials to avoid damage.
  5. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
  6. SEQUENCING
     1. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: MAPEI, which is located at: 1144 E. Newport Ctr. Dr.; Deerfield Beach, FL 33442; Toll Free Tel: 800-992-6273 -Floor Installation; Email: [request info (jwhitfield@mapei.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=MAPEI&coid=33991&rep=&fax=&message=RE:%20Spec%20Question%20(03060mag):%20%20&mf=); Web: <https://www.mapei.com/us/en-us/home-page> | <https://www.mapei.com/ca/en-ca/home>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. ACCELERATORS

\*\* NOTE TO SPECIFIER \*\* Polychem HE is a combination accelerating/water-reducing admixture for concrete. Polychem HE is designed to accelerate the set and increase strength of concrete at all ages. Polychem HE contains chloride and is specifically formulated to promote earlier finishing. It improves the plastic and hardened properties of concrete. Delete if not required.

* + 1. Water-Reducing, Accelerating Admixture - Polychem HE:
       1. Product shall meet or exceed the requirements of ASTM C494, Type E, CRD C87, as well as AASHTO M194.

\*\* NOTE TO SPECIFIER \*\* Use 8 to 32 U.S. oz. per 100 lbs. (520 to 2 080 mL per 100 kg) of cementitious material, depending upon the acceleration needed/required, the ambient temperature and the concrete temperature. Contact MAPEI/GRT's Technical Services Department for assistance.

* + - 1. Dosage: 16 U.S. oz. per 100 lbs. of cement (1 044 mL per 100 kg).
      2. Compressive Strength Test Results:
         1. Mix rate: 16 U.S. oz. (1 044 mL per 100 kg) per 517 lbs. per cu. yd. (305 kg per m3) of cement, with a 3/4 inch (1.9 cm) slump.
         2. 3 Days: 3,310 psi (22,8 MPa).
         3. 7 Days: 4,490 psi (31,0 MPa).
         4. 28 Days: 5,310 psi (36,6 MPa).
      3. Setting Times Test Results: ASTM C 403 Initial Set.
         1. Mix rate: 16 U.S. oz. (1 044 mL per 100 kg) per 517 lbs. per cu. yd. (305 kg per m3) of cement, with a 4 inches (10 cm) slump.
         2. Initial Set: 5 hours, 10 minutes.

\*\* NOTE TO SPECIFIER \*\* Polychem Super Set is a non-chloride, water-reducing admixture formulated to accelerate the strength development and setting time of concrete in cold weather. Polychem Super Set can reduce labor costs associated with the finishing process. Polychem Super Set is non-corrosive and, therefore, will not aid in the corrosion of reinforcing steel embedded within the concrete. It is recommended for use in all types of concrete, especially reinforced and pre-stressed. Delete if not required.

* + 1. Accelerating Admixture - Polychem Super Set:
       1. Product shall meet or exceed the requirements of ASTM C494, Type C and E, CRD C87, as well as AASHTO M194.

\*\* NOTE TO SPECIFIER \*\* Use 8 to 32 U.S. oz. per 100 lbs. (520 to 2 080 mL per 100 kg) of cementitious material, depending upon the acceleration needed/required, the ambient temperature and the concrete temperature. Contact MAPEI/GRT's Technical Services Department for assistance.

* + - 1. Dosage: 16 U.S. oz. per 100 lbs. of cement (1 044 mL per 100 kg).
      2. Compressive Strength Test Results:
         1. Mix rate: Dosage: 16 U.S. oz. (1 044 mL per 100 kg). per 517 lbs. per cu. yd. (305 kg per m3) of cement, with a 3/4 inch (1.9 cm) slump.
         2. 3 Days: 3,550 psi (24,4 MPa).
         3. 7 Days: 4,810 psi (33,2 MPa).
         4. 28 Days: 5,580 psi (38,5 MPa).
      3. Setting Times Test Results: ASTM C 403.
         1. Mix rate: Dosage: 16 U.S. oz. (1 044 mL per 100 kg). per 517 lbs. per cu. yd. (305 kg per m3) of cement, with a 3/4 inch (1.9 cm) slump.

Initial Set: 5 hours, 10 minutes.

* + - * 1. Mix rate: Dosage: 32 U.S. oz. (2 088 mL per 100 kg). per 517 lbs. per cu. yd. (305 kg per m3) of cement, with a 3/4 inch (1.9 cm) slump.

Initial Set: 3 hours, 55 minutes.

\*\* NOTE TO SPECIFIER \*\* Polychem Super Set III is a non-chloride, water-reducing admixture formulated to accelerate the strength development and setting time of concrete in cold weather. Polychem Super Set III can reduce labor costs associated with the finishing process. Polychem Super Set III is non-corrosive and, therefore, will not aid in the corrosion of reinforcing steel embedded within the concrete. It is recommended for use in all types of concrete, especially reinforced and pre-stressed. Delete if not required.

* + 1. Non-Chloride Accelerating Admixture - Polychem Super Set III:
       1. Product shall meet or exceed the requirements of ASTM C 494, Type C and E, CRD C 87, and AASHTO M194.

\*\* NOTE TO SPECIFIER \*\* Use 8 to 32 U.S. oz. per 100 lbs. (520 to 2 080 mL per 100 kg) of cementitious material, depending upon the acceleration needed/required, the ambient temperature and the concrete temperature. Contact MAPEI/GRT's Technical Services Department for assistance.

* + - 1. Dosage: 16 U.S. oz. per 100 lbs. of cement (1 044 mL per 100 kg).
      2. Compressive Strength Test Results:
         1. Mix rate: Dosage: 16 U.S. oz. (1 044 mL per 100 kg). per 520 lbs. per cu. yd. (307 kg per m3) of cement, with a 3/4 inch (1.9 cm) slump.
         2. 3 Days: 4,320 psi (29.7 MPa).
         3. 7 Days: 5,040 psi (34,8 MPa).
         4. 28 Days: 7,320 psi (50,5 MPa).
      3. Setting Times Test Results: ASTM C 403.
         1. Mix rate: Dosage: 16 U.S. oz. (1 044 mL per 100 kg). per 520 lbs. per cu. yd. (307 kg per m3) of cement, with a 3/4 inch (1.9 cm) slump.
         2. Initial Set: 3 hours, 36 minutes.
         3. Final Set: 5 hours, 42 minutes.

\*\* NOTE TO SPECIFIER \*\* Polychem Super Set Plus is a non-chloride admixture formulated to accelerate the strength development and setting time of concrete in cold weather. Delete if not required.

* + 1. Accelerating Admixture - Polychem Super Set Plus
       1. Product shall meet or exceed the requirements of ASTM C494, Type C, CRD C87, as well as AASHTO M194.

\*\* NOTE TO SPECIFIER \*\* Use 8 to 32 U.S. oz. per 100 lbs. (520 to 2 080 mL per 100 kg) of cementitious material, depending upon the acceleration needed/required, the ambient temperature and the concrete temperature. Dosage rates outside of the suggested range should be tested before using in production. Contact MAPEI/GRT's Technical Services Department for assistance.

* + - 1. Dosage: 21 U.S. oz. per 100 lbs. of cement (1 370 mL per 100 kg).
      2. Compressive Strength Test Results:
         1. Mix rate: 21 U.S. oz. (1 370 mL per 100 kg) per 517 lbs. per cu. yd. (305 kg per m3) of cement, with a 4 inches (10 cm) slump.
         2. 3 Days: 4,400 psi (30,3 MPa).
         3. 7 Days: 4,510 psi (31,1 MPa).
         4. 28 Days: 5,260 psi (36,3 MPa).
      3. Setting Times Test Results: ASTM C 403.
         1. Mix rate: 21 U.S. oz. (1 370 mL per 100 kg) per 517 lbs. per cu. yd. (305 kg per m3) of cement, with a 4 inches (10 cm) slump.
         2. Initial Set: 2 hours, 49 minutes.
         3. Final Set: 4 hours, 5 minutes.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. AIR-ENTRAINING AGENTS

\*\* NOTE TO SPECIFIER \*\* Insert percentage air entrainment required.

* + 1. Exterior concrete shall contain an air entraining agent, as manufactured by General Resource Technology, in an amount to yield \_\_\_% air in the concrete.
    2. Concrete mixtures shall be tested regularly during production to verify that the air content meet the technical requirements and Project specifications.

\*\* NOTE TO SPECIFIER \*\* Polychem AE is a specially developed, multi-component air-entraining agent that produces an air-void system superior to that produced by Vinsol-resin-based air-entraining agents. Polychem AE typically has lower dosage rates than Vinsol-resin-based agents and produces smaller, more well-distributed bubbles with excellent dispersion. Delete if not required.

* + 1. Air-Entraining Admixture - Polychem AE:
       1. Product shall meet or exceed the requirements of ASTM C 260, CRD C 13, and AASHTO M 154.
       2. Type: Specially developed multi-component air entraining agent.

\*\* NOTE TO SPECIFIER \*\* Dosage rates of 1/4 - 2 fl. oz. per 100 lbs. (16 -131 ml per 100 kg) of cementitious material. Field tests will determine the proper dosage for each set of materials. (There may be certain mixtures which will require substantially higher dosage rates.)

* + - 1. Dosage Rate: \_\_\_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\* Polychem SA is a specifically developed, multi-component air-entraining admixture that has been stabilized to produce an air-void system consistent with industry requirements and standards. When added separately, Polychem SA will produce an air-void system that is equivalent to or exceeds that of pure Vinsol-resin-based admixtures at substantially reduced dosage rates. Polychem SA is a synthetic-based alpha olefin that will produce a small, more well-defined and spaced bubble structure, which is stabilized to be more efficient when used in producing concrete mixtures containing low alkali cement or supplementary cementitious materials. Delete if not required.

* + 1. Air-Entraining Admixture - Polychem SA:
       1. Product shall meet or exceeds the requirements of ASTM C 260, CRD C-13, and AASHTO M 154.
       2. Type: Specially developed multi-component synthetic based alpha-olefin air entraining agent.

\*\* NOTE TO SPECIFIER \*\* Dosage rates of .20 to 2.0 fl. oz. /100 wt (13 -131 ml per 100 kg) cementitious material. Field tests will determine the proper dosage for each set of materials (Some concrete mixtures may require higher dosage rates).

* + - 1. Dosage Rate: \_\_\_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\* Polychem SA-50 is a specifically developed, multi-component air-entraining admixture that has been stabilized to produce an air-void system consistent with industry requirements and standards. Polychem SA-50 is a reduced-solids version of Polychem SA. When added separately, Polychem SA-50 will produce an air-void system that is equivalent to or exceeds that of pure Vinsol-resin-based admixtures at reduced dosage rates. Polychem SA-50 is a synthetic-based alpha olefin that will produce a small, more well-defined and spaced bubble structure, which is stabilized to be more efficient when used in producing concrete mixtures containing low alkali cement or supplementary cementitious materials. Polychem SA-50 has been formulated specifically for ready-mix and precast concrete applications where the need for accurate dispensing with a small load size may be an issue. Delete if not required.

* + 1. Air-Entraining Admixture - Polychem SA-50:
       1. Product shall meet or exceed the requirements of ASTM C 260, CRD C-13, and AASHTO M 154.
       2. Type: Specially developed multi-component synthetic based alpha-olefin air entraining agent.

\*\* NOTE TO SPECIFIER \*\* Dosage rates of .50 to 3.0 fl. oz. /100 wt (33 -197 ml per 100 kg) cementitious material. Field tests will determine the proper dosage for each set of materials (Some concrete mixtures may require higher dosage rates).

* + - 1. Dosage Rate: \_\_\_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\* Polychem VR is a ready-to-use air-entraining agent in an aqueous solution of neutralized Vinsol resin. Polychem VR is used in exterior concrete such as sidewalks, curbs, highway paving, bridge decks, parking structures, and any other areas requiring protection from de-icing salts and freeze/thaw damage. Delete if not required.

* + 1. Air-Entraining Admixture - Polychem VR:
       1. Product shall meet or exceed the requirements of ASTM C 260, CRD 13, and AASHTO M 154.
       2. Type: Aqueous solution of neutralized Vinsol Resin.

\*\* NOTE TO SPECIFIER \*\* Dosage rate of Polychem VR required to obtain a given percentage of entrained air will vary depending on slump, ambient temperature, temperature of the mix, use of fly ash, sand gradations, and the type of cement. Polychem VR is normally used at 1/8 to 3 fl. oz. per 100 lb. (8 -197 ml per 100 kg) of cement. Trial batches should be run to confirm dosages.

* + - 1. Dosage Rate: \_\_\_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\* Polychem VRC is a concentrated, ready-to-use air-entraining agent in an aqueous solution of neutralized Vinsol resin. Polychem VRC is used in exterior concrete such as sidewalks, curbs, highway paving, bridge decks, parking structures, and any other areas requiring protection from de-icing salts and freeze/thaw damage. Delete if not required.

* + 1. Air-Entraining Admixture (Concentrate) - Polychem VRC:
       1. Product shall meet or exceed the requirements of ASTM C 260, CRD 13, and AASHTO M 154.
       2. Type: Aqueous solution of neutralized Vinsol Resin (Concentrate).

\*\* NOTE TO SPECIFIER \*\* Dosage rate of Polychem VRC required to obtain a given percentage of entrained air will vary depending on slump, ambient temperature, temperature of the mix, use of fly ash, sand gradations, and the type of cement. Polychem VRC is normally used at 1/8 to 3 fl. oz. per 100 lb. (8 -197 ml per 100 kg) of cement.  
Trial batches should be run to confirm dosages.

* + - 1. Dosage Rate: \_\_\_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. CORROSION INHIBITORS

\*\* NOTE TO SPECIFIER \*\* Polychem CI is a calcium nitrite, liquid corrosion-inhibiting admixture for concrete containing steel reinforcement. Polychem CI chemically inhibits the onset of corrosion from chlorides on the reinforcing steel. Polychem CI has a minimum of 30% calcium nitrite by mass. Polychem CI weighs approximately 10.6 lbs. per U.S. gallon (1.25 kg/L) and has exactly the same chemical makeup as other 30% calcium nitrite corrosion-inhibiting admixtures. Delete if not required.

* + 1. Corrosion Inhibitors - Polychem CI
       1. Product shall meet or exceed the requirements of ASTM C 494, Type C, and AASHTO M 194.
       2. Type: Calcium Nitrite, Corrosion-Inhibiting, Non-Chloride Accelerating Admixture for Concrete.

\*\* NOTE TO SPECIFIER \*\* The project will indicate or specify the amount necessary. Dosage rate is directly related to the level of chloride protection. Recommended for use at a dose of 2 to 5 gallons per cubic yard (10 to 25 L/cu. meter) of concrete.

* + - 1. Dosage Rate: \_\_\_\_ gal. / cy.
      2. Mix Adjustment: The calculated water in the mix design shall be reduced by the water added through the addition of the corrosion inhibitor. The adjustment factor is 7.2 lbs of water for each gallon.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. MASONRY PRODUCTS

\*\* NOTE TO SPECIFIER \*\* HCSP is a highly concentrated plasticizer that is designed for use in low-slump concrete pipe production. HCSP is formulated to produce a web on the concrete pipe that has a very smooth texture. HCSP can be used in the production of other low-slump concrete products (such as concrete block and roof tile) to achieve a medium to heavy swipe. HCSP is a ready-to-use liquid that improves workability while maintaining cohesiveness and achieving fuller hydration rates of the cement in low-slump concrete mixes. HCSP does not contain calcium chloride or any chloride-based components. It will not promote or contribute to corrosion of reinforcing steel in concrete pipe. Delete if not required.

* + 1. Low-Slump Concrete Superplasticizer - HCSP:
       1. Product shall not contain calcium chloride or any chloride-based components.
       2. Product shall not promote or contribute to corrosion of reinforcing steel in concrete products.

\*\* NOTE TO SPECIFIER \*\* HCSP is recommended for use at a dose of 1 to 5 ounces per 100 lbs (64 -328 ml per 100 kg) of cementitious material. Because local job conditions vary, contact your local GRT representative for further assistance if using this product outside the recommended dosage ranges or when combining with other admixtures.

* + - 1. Dosage Rate: \_\_\_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\* MP-10 is a high-performance, efflorescence-reducing, water-repelling admixture for both wet- and dry-cast concrete applications. MP-10 dry and semi-dry applications include concrete masonry units, SRWs and pavers. MP-10 wet-cast applications include architectural precast and stone veneer. Delete if not required.

* + 1. Efflorescence Reducer / Water Repellent - MP-10:
       1. Product shall be compatible with Portland cement, fly ash, slag (GGBFS), silica fume, fibers, air entraining or water reducing admixtures.

\*\* NOTE TO SPECIFIER \*\* Generally a total mix time of 90 seconds is required, and the mixing time after the introduction of MP-10 should be evaluated by trials. MP-10 can be added with the batching water or at the end of the mixing process. Do not add MP-10 onto dry cementitious materials as this will reduce the admixture performance.

* + - 1. Product is a low dose admixture and will require sufficient mixing time to be distributed throughout the entire batch resulting in uniform performance.

\*\* NOTE TO SPECIFIER \*\* To reduce efflorescence, a typical dosage range of 2 to 4 oz. / cwt (128 to 262 ml per 100 kg) will achieve the desired performance. Delete if not required.

* + - 1. Efflorescence Reduction:
         1. Dosage: \_\_\_ oz. / cwt.

\*\* NOTE TO SPECIFIER \*\* When water repellency is required, a typical dosage range of 4 to 8 oz. / cwt (256 -328 ml per 525 kg) will achieve the desired performance. Delete if not required.

* + - 1. Water Repellency:
         1. Dosage: \_\_\_ oz. / cwt.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. RETARDERS

\*\* NOTE TO SPECIFIER \*\* Polychem Renu is a ready-to-use liquid solution manufactured to control the hydration process in Portland-cement concrete and concrete washwater. This advanced-set retarder coats the hydrating cement particles in the concrete and washwater, resulting in the suspension of the hydration chemical reaction. Polychem Renu maintains the plasticity, slump and temperature as it postpones the set of the concrete for a predictable period of time. Eventually, the Polychem Renu dosage is chemically consumed, allowing normal hydration to continue. Delete if not required.

* + 1. Hydration-Stabilizing Admixture for Concrete - Polychem Renu:
       1. Products shall conform to ASTM C-494 Types B and D, AASHTO M-194 Types B and D, CRD C-87 Types B and D.
       2. Product shall be compatible with all types of Portland Cement, class C and F flyash, silica fume, fibers, and approved air entraining and water-reducing admixtures.

\*\* NOTE TO SPECIFIER \*\* The recommended dosage of Polychem Renu, for treatment of concrete wash water, is 16 to 64 ozs. (473 to 1893 mL) per truck. The specific dosage will depend on ambient temperature and desired stabilization period. Concrete wash water, treated with Polychem Renu, can be re-dosed once if the scheduling conflicts arise to extend the use of wash water as mix water. Delete if not required.

* + - 1. Concrete Wash Water Treatment:
         1. Dosage: \_\_\_ ozs / truck.

\*\* NOTE TO SPECIFIER \*\* The recommended dosage of Polychem Renu for long haul applications and extended truck discharge times is 1 to 12 ozs. Per 100 lbs (65 to 783 mL per 100 kg) of Portland cement. Delete if not required.

* + - 1. Long Haul Treatment:
         1. Dosage: \_\_\_ ozs / cwt.

\*\* NOTE TO SPECIFIER \*\* Polychem-R is a highly concentrated liquid admixture conforming to ASTM C494, Type D. Polychem-R reduces the quantity of mixing water required to produce concrete of a standard consistency with the benefit of extended slump life and workability. Concrete produced with Polychem-R will experience rapid strength development after the initial set occurs. If retardation is within the normal ASTM C494, Type B and D specifications, Polychem-R will develop higher early and ultimate strengths than regular concrete under normal comparable curing conditions. Delete if not required.

* + 1. Retarder - Polychem-R:
       1. Product shall meet or exceed the requirements of ASTM C 494, Type D, CRD C 87, and AASHTO M 194.
       2. Product shall be compatible with all types of Portland cement, calcium chloride and air entraining agents.
       3. Product shall not contain calcium chloride as a component.

\*\* NOTE TO SPECIFIER \*\* Dosage rates of 2 to 5 oz. per 100# (128 to 328 ml per 100 kg) cementitious material for normal concrete mixes incorporating normal concrete ingredients. Variation in job conditions and materials may dictate dosage rates other than stated

* + - 1. Dosage: \_\_\_ ozs / cwt.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. SHRINKAGE REDUCER

\*\* NOTE TO SPECIFIER \*\* SRA-157 is a liquid shrinkage-reducing admixture that can be used in any Portland-cement-based product to significantly reduce drying shrinkage. SRA-157 is not expansive material, but rather functions by blocking capillaries of pore water, which is the major mechanism that causes drying shrinkage in concrete. When added to concrete at a rate of 2% by weight of cementitious material, SRA-157 can reduce shrinkage by up to 80% at 28 days of age and by up to 50% at one year of age. Delete if not required.

* + 1. Shrinkage-Reducing Admixture - SRA-157:
       1. Product shall meet or exceed the requirements of ASTM C 157.
       2. Product shall not function as an expansive material.
       3. Product shall be compatible with all types of Portland cement, class C and F flyash, silica fume, fibers, approved air entrainers, water reducers, mid-range water reducers, corrosion inhibitors and super plasticizing admixtures.

\*\* NOTE TO SPECIFIER \*\* SRA-157 is recommended for use at a dose of 1.0% to 2.5% by weight of cementitious. For maximum effectiveness use 2% by weight of cementitious. For example: a mix containing 600 lbs./yard, 2% equates to 12 lbs/yard. The shrinkage reduction is generally linear within the recommended dosage range, so any dosage within this range can be selected based on the degree of shrinkage reduction desired. Compressive strength may be slightly less than normal. It is reasonable to expect a 0 to 10% strength loss.

* + - 1. Dosage Rate: \_\_ % by weight.
      2. Mix Adjustment: The calculated water in the mix design shall be reduced by the water added through the addition of the shrinkage reducer. The adjustment factor is 7.2 lbs of water for each gallon.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. SILICA FUME

\*\* NOTE TO SPECIFIER \*\* Microsilica is an amorphous silicon dioxide (silica) consisting of sub-micron spherical primary particles and agglomerates of these. The material is highly reactive in cementitious and ceramic bond systems. Delete if not required.

* + 1. Silica Fume - Microsilica:
       1. Product shall comply with the provisions and specifications of ASTM C-1240 and AASHTO M307.

\*\* NOTE TO SPECIFIER \*\* In order to give best results, Microsilica should be used in quantities of 3 to 8 wt% of the total dry mix. When optimum particle packing is applied, the water demand is normally 4 to 5% of the total dry weight, depending on the Microsilica quantity. For Microsilica to have the desired flow enhancing properties, it is vital that it is well-dispersed. It is generally advised to use deflocculates. Among a variety of different additives available, the most commonly used in Microsilica contain castables are polyacrylates and different phosphates.

* + - 1. Dosage Rate: \_\_\_ % dry weight.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. SLUMP-RETENTION ADMIXTURE

\*\* NOTE TO SPECIFIER \*\* Extendflo RC is a revolutionary new technology based on significant advances in the admixture industry. When used as part of an admixture system, it provides slump retention without retardation. Extendflo RC gives the concrete producer the ability to immediately create the ideal admixture system for fluctuating regional raw materials, environmental conditions and project requirements. Delete if not required.

* + 1. Slump-Retention Admixture - Extendflo RC:
       1. Product shall conform to ASTM C 494 Type S ASTM C 494M Type S Specific Performance, Admixtures.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. SPECIALTY PRODUCT

\*\* NOTE TO SPECIFIER \*\* ASR Mitigator admixture is a lithium-based, specially formulated admixture that is designed to control alkali-silica reactivity (ASR) in concrete. Delete if not required.

* + 1. Lithium Nitrate - ASR Mitigator:
       1. Product contains lithium nitrate (LiNO3) in solution.

\*\* NOTE TO SPECIFIER \*\* The amount of ASR Mitigator needed to mitigate ASR in fresh concrete is a function of the sodium equivalent (Na2Oe)\* of the cement and the amount of cement used per cubic yard of concrete. For every pound of Na2Oe present in a cubic yard of concrete, the standard dose is 0.55 gallon of ASR Mitigator. This number is then multiplied by the % of the standard dose found to be effective in performance testing. For every gallon of ASR Mitigator needed in the mix, subtract 0.85 gallon of water from the original mix design. The dosage of ASR Mitigator can generally be significantly reduced when the material is used in conjunction with certain pozzolans such as Class F fly ash.

* + - 1. Dosage: \_\_\_ .

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. SUPERPLASTICIZERS

\*\* NOTE TO SPECIFIER \*\* Dynamon SX is a high-performance, water-reducing admixture for concrete, is based on polycarboxylate technology and belongs to MAPEI's Dynamon system. Dynamon SX meets the requirements of ASTM C494 Type F and AASHTO M194 Type F. Delete if not required.

* + 1. High-Range Water-Reducing Admixture - Dynamon SX:
       1. Product shall meet the requirements of ASTM C494 Type F and AASHTO M194 Type F.
       2. Product shall not contain calcium chloride or other chloride-based components.
       3. Product use shall not contribute to the increased corrosion of reinforcing steel in concrete.

\*\* NOTE TO SPECIFIER \*\* Use 3 to 15 U.S. oz. per 100 lbs. (200 to 975 mL per 100 kg) of cementitious material. Dosage rates outside of the suggested range should be tested before using in production. Contact MAPEI/GRT's Technical Services Department for assistance.

* + - 1. Dosage: \_\_\_ oz. / cwt.

\*\* NOTE TO SPECIFIER \*\* EVO 2500 is the latest in polycarboxylate technology that has been formulated to effectively meet demanding expectations for high-performance concrete. EVO 2500 will increase dispersion and hydration of all cementitious materials, while enhancing the rheology and strength characteristics of concrete at all ages. EVO 2500 is designed to be used in all concrete applications by varying the dosage rate, including those that may require high flowability or complete self-consolidating concrete (SCC) while maintaining workability and normal-setting characteristics. EVO 2500 does not contain calcium chloride or any chloride-based components. Its use will not contribute to the increased corrosion of reinforcing steel in concrete. Delete if not required.

* + 1. Complete-Range Water-Reducing Admixture - EVO 2500:
       1. Product shall conform to ASTM C 494, Types A and F, AASHTO M 194 Types A and F.
       2. Product shall not contain calcium chloride or other chloride-based components.
       3. Product use shall not contribute to the increased corrosion of reinforcing steel in concrete.

\*\* NOTE TO SPECIFIER \*\* EVO 2500 may be used at varying dosage rates to meet the requirements and specifications of all concrete mixtures (Dosage rates may vary due to job conditions and concrete materials, it is recommended that you contact your local General Resource Technology technical sales representative for recommendations on how to optimize performance to meet your specific needs).

* + - 1. Dosage Rate: \_\_.
      2. Do not use product in conjunction with admixtures that may contain some forms of Naphthalene-Sulfonate blends. Slump, flowability, and pump- ability may be adversely affected.

\*\* NOTE TO SPECIFIER \*\* HCSP is a highly concentrated plasticizer that is designed for use in low-slump concrete pipe production. HCSP is formulated to produce a web on the concrete pipe that has a very smooth texture. HCSP can be used in the production of other low-slump concrete products (such as concrete block and roof tile) to achieve a medium to heavy swipe. HCSP is a ready-to-use liquid that improves workability while maintaining cohesiveness and achieving fuller hydration rates of the cement in low-slump concrete mixes. HCSP does not contain calcium chloride or any chloride-based components. It will not promote or contribute to corrosion of reinforcing steel in concrete pipe. Delete if not required.

* + 1. Low-Slump Concrete Superplasticizer - HCSP:
       1. Product shall not contain calcium chloride or any chloride-based components.
       2. Product shall not promote or contribute to corrosion of reinforcing steel in concrete products.

\*\* NOTE TO SPECIFIER \*\* HCSP is recommended for use at a dose of 1 to 5 ounces per 100 lbs (64 -328 ml per 100 kg) of cementitious material. Because local job conditions vary, contact your local GRT representative for further assistance if using this product outside the recommended dosage ranges or when combining with other admixtures.

* + - 1. Dosage Rate: \_\_\_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\* Melchem is a water-soluble, melamine-based, high-range water-reducing admixture (superplasticizer). Melchem can reduce mixing water up to 30%, producing high-strength concrete with a low water/cement ratio that can be placed at normal levels of workability or can be added to a mix to produce flowing concrete with increased strength. Melchem is chloride-free and non-corrosive. Melchem is recommended for use in all concretes, especially reinforced/prestressed and post-tensioned concretes. Delete if not required.

* + 1. Superplasticizer - Melchem:
       1. Product shall conform to ASTM C 494, Type A and F, and AASHTO M 194.
       2. Product Type: Water-soluble melamine based high-range water reducing admixture (Superplasticizer).

\*\* NOTE TO SPECIFIER \*\* 6 to 18 oz. per cwt of cementitious product. Job site added to concrete with a 2 inches (51 mm) slump minimum, completely mixed before placement. Delete if not required.

* + - 1. Flowing Concrete Application:
         1. Dosage Rate: \_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\*6 to 25 oz. per cwt of cementitious product. Added with mixing water. Delete if not required.

* + - 1. Prestressed/ Precast Application:
         1. Dosage Rate: \_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\* Melchem-M is a water-soluble, melamine-based, high-range water-reducing admixture (superplasticizer). Melchem-M can reduce mixing water up to 30%, producing high-strength concrete with a low water/cement ratio that can be placed at normal levels of workability or can be added to a mix to produce flowing concrete with increased strength. Chloride-free and non-corrosive, Melchem-M is modified to provide a longer slump life to fresh concrete. Melchem-M is recommended for use in all concretes, especially reinforced/prestressed and post-tensioned concretes. Delete if not required.

* + 1. Superplasticizer - Melchem-M:
       1. Product shall conform to ASTM C 494, Type A and F, and AASHTO M 194.
       2. Product Type: Water-soluble melamine based high-range water reducing admixture (Superplasticizer).

\*\* NOTE TO SPECIFIER \*\* 6 to 18 oz. per cwt of cementitious product. Job site added to concrete with a 2 inches (51 mm) slump minimum, completely mixed before placement. Delete if not required.

* + - 1. Flowing Concrete Application:
         1. Dosage Rate: \_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\*6 to 25 oz. per cwt of cementitious product. Added with mixing water. Delete if not required.

* + - 1. Prestressed/ Precast Application:
         1. Dosage Rate: \_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\* PC-441 is a water-soluble, naphthalene-based, high-range water-reducing admixture. PC-441 can reduce mixing water up to 30%, producing high-strength concrete with a low water/cement ratio that can be placed at normal levels of workability or can be added to a mix to produce flowing concrete with increased strength. PC-441 is chloride-free and non-corrosive. PC-441 is recommended for use in all concrete, especially reinforced/prestressed and post-tensioned concrete. Delete if not required.

* + 1. Superplasticizer - PC-441:
       1. Product shall conform to ASTM C 494, Type A and F, and AASHTO M 194, Type A & F.
       2. Product Type: Water-soluble naphthalene based high range water reducing admixture (Superplasticizer).

\*\* NOTE TO SPECIFIER \*\* 6 to 18 oz. per cwt of cementitious product. Job site added to concrete with a 2 inches (51 mm) slump minimum, completely mixed before placement. Delete if not required.

* + - 1. Flowing Concrete Application:
         1. Dosage Rate: \_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\*6 to 25 oz. per cwt of cementitious product. Added with mixing water. Delete if not required.

* + - 1. Prestressed/ Precast Application:
         1. Dosage Rate: \_\_ oz. per cwt.

\*\* NOTE TO SPECIFIER \*\* Polychem 3000 is a normal-setting, multi-range water-reducing admixture for concrete utilizing polycarboxylate technology. Polychem 3000 is designed to facilitate the placing and finishing of ready-mixed concrete that is highly flowable and workable for conventional periods of time with normal-setting characteristics. Delete if not required.

* + 1. Multi-Range Water-Reducing Admixture - Polychem 3000:
       1. Product shall conform to ASTM C 494 Types A and F, AASHTO M 194 Types A and F, CRD C 87 Types A and F. All other Federal and State specifications.
       2. Product Type: Normal setting, multi-range, water-reducing admixture for concrete utilizing polycarboxylate technology.
       3. Product shall not contain calcium chloride or any chloride-based components. It will not promote or contribute to corrosion or reinforcing steel in concrete.
       4. Product shall conform to the minimum chloride ion limits published by current construction industry standards.
       5. Products shall be compatible with all types Portland cement, Class C and F fly ash, silica fume, fibers, approved air entraining, and water-reducing admixtures.
       6. Product can be used in white, colored, and architectural concrete.

\*\* NOTE TO SPECIFIER \*\* Polychem 3000 is recommended for use at a dose of 1-20 fl. oz. per 100# (65 to 1305ml per 100kg) of cementitious material to meet the requirements of ASTM C 494 Type A water-reducing and Type F high-range water reducing admixture.

* + - 1. Dosage Rate: \_\_ oz. per cwt of cement.

\*\* NOTE TO SPECIFIER \*\* Polychem 850 is a normal-setting, multi-range water-reducing admixture for concrete utilizing polycarboxylate technology. Polychem 850 is designed to facilitate the placing and finishing of ready-mixed concrete that is highly flowable and workable for extended periods of time with normal-setting characteristics. Delete if not required.

* + 1. Multi-Range Water-Reducing Admixture - Polychem 850:
       1. Product shall conform to ASTM C 494 Types A and F, AASHTO M 194 Types A and F, CRD C 87 Types A and F. All other Federal and State specifications.
       2. Product Type: Normal setting, multi-range, water-reducing admixture for concrete utilizing polycarboxylate technology.
       3. Product shall not contain calcium chloride or any chloride-based components. It will not promote or contribute to corrosion or reinforcing steel in concrete.
       4. Product shall conform to the minimum chloride ion limits published by current construction industry standards.
       5. Products shall be compatible with all types Portland cement, Class C and F fly ash, silica fume, fibers, approved air entraining, and water-reducing admixtures.
       6. Product can be used in white, colored, and architectural concrete.

\*\* NOTE TO SPECIFIER \*\* Polychem 850 is recommended for use at a dose of 1-20 fl. oz. per 100# (65 to 1305ml per 100kg) of cementitious material to meet the requirements of ASTM C 494 Type A water-reducing and Type F high-range water reducing admixture.

* + - 1. Dosage Rate: \_\_ oz. per cwt of cement.

\*\* NOTE TO SPECIFIER \*\* Polychem BP is a ready-to-use, high-performance, liquid plasticizer recommended for use in concrete block (both standard weight and lightweight). Polychem BP is also effective in the production of concrete pipe, especially when low slump is required. Polychem BP is added to pipe or block mixes during the mixing process. It should not be added directly to cement. No additional mixing time is necessary. Delete if not required.

* + 1. Block Plasticizer - Polychem BP:

\*\* NOTE TO SPECIFIER \*\* 2 to 6 oz. per 100# cementitious materials. Over dosing with Polychem BP will typically produce increased workability. Specific applications may be determined by evaluation of performance. Contact your GRT/Polychem representative for assistance

* + - 1. Dosage Rate: \_\_ oz. per cwt cement.

\*\* NOTE TO SPECIFIER \*\* Polychem SPC is a normal-setting complete-range water-reducing admixture based on polycarboxylate chemistry. Polychem SPC is designed to be used in all concrete applications by varying the dosage rate, including those that may require high flowability or complete self-consolidating concrete (SCC) while maintaining workability and normal-setting characteristics. Polychem SPC does not contain calcium chloride or any chlorine-based components. Its use will not contribute to the increased corrosion of reinforcing steel in concrete. Delete if not required.

* + 1. Complete-Range Water-Reducing Admixture - Polychem SPC:
       1. Product shall conform to ASTM C 494, Types A and F, AASHTO M 194 Types A and F.
       2. Product Type: Normal setting, multi-range, water-reducing admixture for concrete utilizing polycarboxylate technology.
       3. Product shall not contain calcium chloride or any chloride-based components. It will not promote or contribute to corrosion or reinforcing steel in concrete.
       4. Products shall be compatible with all types Portland cement, Class C and F fly ash, slag (GBFS), silica fume, fibers, approved air entraining, and water-reducing admixtures.
       5. Product can be used in white, colored, and architectural concrete.

\*\* NOTE TO SPECIFIER \*\* Specific applications may be determined by evaluation of performance. Contact your GRT/Polychem representative for assistance

* + - 1. Dosage Rate: \_\_ oz. per cwt cement.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. VISCOSITY-MODIFYING AGENTS

\*\* NOTE TO SPECIFIER \*\* DG-F is a dry powder (biopolymer / highly refined diutan gum) admixture packaged in a ready-to-use, water-soluble bag that can be added to Portland-cement concrete based upon the application and specific load size. DG-F is a fast-hydrating biopolymer that has been specifically designed for use in applications of Portland-cement concrete, gypsum products and calcium aluminate cement. DG-F may be used as an AWA (anti-washout admixture) or a VMA (viscosity-modifying admixture) depending on project requirements or contractor needs. Delete if not required.

* + 1. Anti-Washout and Viscosity-Modifying Admixture - DG-F:
       1. Product Type: Dry powder (biopolymer, highly refined diutan gum) admixture.

\*\* NOTE TO SPECIFIER \*\* Delete application not required.

* + - 1. VMA Applications:
         1. 1/10 (.1) lb to 2/10 (.2) per cubic yard.
      2. AWA Applications:
         1. 2/10 (.2) to 4/10 (.4) lb. per cubic yard.

\*\* NOTE TO SPECIFIER \*\* Polychem VMA is specifically formulated to improve the viscosity of highly flowable mixes, decrease the potential for segregation and improve the finishing characteristics of lean concrete mixes. Polychem VMA is recommended for use in Self-Consolidating Concrete (SCC), concrete containing manufactured sand and high water-to-cement ratio mixes. Delete if not required.

* + 1. Viscosity-Modifying Admixture - Polychem VMA:
       1. Application: Self-Consolidating Concrete (SCC).

\*\* NOTE TO SPECIFIER \*\* Polychem VMA is recommended for use at a dose of 2-10 fluid ounces per 100 lbs. of cementitious materials for most applications. Contact your local GRT representative for technical assistance when using this product.

* + - 1. Dosage Rate: \_\_\_ oz. per cwt cement.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. WATER REDUCERS

\*\* NOTE TO SPECIFIER \*\* KB-1200 is used in all concrete where ease of placement, normal set times and increased workability are desired. Used in all flatwork, curb mixes and walls, KB-1200 is compatible with a wide range of cements, fly ashes and aggregates. KB-1200 provides concrete with lower permeability, little or no bleeding, and greater workability at the surface. KB-1200 does not contain calcium chloride. Delete if not required.

* + 1. Finishing Aid / Water Reducer - KB-1200:
       1. Product shall meet or exceed requirements of ASTM C 494, Type A & F, AASHTO M 194 Types A & F, and CRD C 87 Types A & F.
       2. Product shall be compatible with all types of Portland cement, class C and F fly ash, silica fume, calcium chloride, fibers and approved air entraining, accelerating, retarding, superplasticizing, and water reducing admixtures.
       3. Product may be used in white, colored, and architectural concrete.

\*\* NOTE TO SPECIFIER \*\* KB-1200 is recommended for use at a dosage rate of 3 to 12 fluid ounces per 100 pounds of cementitious material.

* + - 1. Dosage Rate: \_\_ oz. per cwt cement.

\*\* NOTE TO SPECIFIER \*\* Polychem 383 is a normal-setting, mid-range water-reducing admixture based on polycarboxylate chemistry. Polychem 383 is designed to be used in all concrete applications by varying the dosage rate while maintaining workability, neutral-setting characteristics and improved finishability characteristics. Polychem 383 does not contain calcium chloride or any chloride-based components. Its use will not contribute to the increased corrosion of reinforcing steel in concrete. Delete if not required.

* + 1. Mid-Range Water-Reducing Admixture - Polychem 383:
       1. Product shall conform to ASTM C 494, Type A, as well as AASHTO M194 Type A.
       2. Product Type: Water-reducing admixture based on polycarboxylate chemistry.
       3. Product shall be compatible with all types of Portland cement, class C and F fly ash, silica fume, calcium chloride, fibers and approved air entraining, accelerating, retarding, super plasticizing, and water reducing admixtures.
       4. Product may be used in white, colored, and architectural concrete.

\*\* NOTE TO SPECIFIER \*\* Polychem 383 may be used at varying dosage rates to meet the requirements and specifications of all concrete mixtures (Dosage rates may vary due to job conditions and concrete materials, it is recommended that you contact your local General Resource Technology technical sales representative for recommendations on how to optimize performance to meet your specific needs).  
Polychem 383 has a recommended dosage rate of 2-3 fluid ounces per 100 pounds of cementitious material to meet ASTM C 494 Type A applcations.  
Polychem 383 has a recommended dosage rate of 3-6 fluid ounces per 100 pounds of cementitious material to meet most mid-range applications.

* + - 1. Dosage Rate: \_\_ oz. per cwt cement.

\*\* NOTE TO SPECIFIER \*\* Polychem 400 NC is a normal-setting, multi-component, highly concentrated, water-reducing admixture conforming to ASTM C494 Type A. Polychem 400 NC will reduce the quantity of water required to produce concrete of a desired consistency, while providing greater economy for a given strength. It will increase strengths and improve workability and finishing characteristics. Polychem 400 NC does not contain calcium chloride, and is compatible with air-entrained and non-air-entrained mixes. Delete if not required.

* + 1. Water-Reducing Admixture - Polychem 400 NC:
       1. Product shall meet or exceed ASTM C 494, Type A CRD C87, AASHTO M 194.
       2. Product shall be compatible with approved air entrainment admixtures, calcium chloride, stearates and similar chemical derivatives.
       3. Product shall not entrain air significantly.
       4. Dosage Rate: 3 to 5 oz. per 100 lbs. cementitious material.

\*\* NOTE TO SPECIFIER \*\* Polychem 775 is a normal-setting, complete-range water-reducing admixture based on polycarboxylate chemistry. Polychem 775 is designed to be used in all concrete applications by varying the dosage rate including those that may require high flowability or complete self-consolidating concrete (SCC) while maintaining workability and normal-setting characteristics. Polychem 775 does not contain calcium chloride or any chloride-based components. Its use will not contribute to the increased corrosion of reinforcing steel in concrete. Delete if not required.

* + 1. Complete-Range Water-Reducing Admixture - Polychem 775:
       1. Product shall conform to ASTM C 494, Types A and F, AASHTO M 194 Types A and F.
       2. Product Type: Normal setting complete-range, water-reducing admixture based on polycarboxylate chemistry.
       3. Products shall be compatible with all types Portland cement, Class C and F fly ash, slag (GBFS), silica fume, fibers, approved air entraining, and water-reducing admixtures.
       4. Product can be used in white, colored, and architectural concrete.

\*\* NOTE TO SPECIFIER \*\* Dosage rates may vary due to job conditions and concrete materials, it is recommended that you contact your local General Resource Technology technical sales representative for recommendations on how to optimize performance to meet your specific needs.

* + - 1. Dosage Rate: \_\_

\*\* NOTE TO SPECIFIER \*\* Polychem 850 is a normal-setting, multi-range water-reducing admixture for concrete utilizing polycarboxylate technology. Polychem 850 is designed to facilitate the placing and finishing of ready-mixed concrete that is highly flowable and workable for extended periods of time with normal-setting characteristics. Delete if not required.

* + 1. Multi-Range Water-Reducing Admixture - Polychem 850
       1. Product shall conform to ASTM C 494 Types A and F, AASHTO M 194 Types A and F, CRD C 87 Types A and F. All other Federal and State specifications.
       2. Product Type: Normal setting, multi-range, water-reducing admixture for concrete utilizing polycarboxylate technology.
       3. Product shall not contain calcium chloride or any chloride-based components. It will not promote or contribute to corrosion or reinforcing steel in concrete.
       4. Product shall conform to the minimum chloride ion limits published by current construction industry standards.
       5. Products shall be compatible with all types Portland cement, Class C and F fly ash, silica fume, fibers, approved air entraining, and water-reducing admixtures.
       6. Product can be used in white, colored, and architectural concrete.

\*\* NOTE TO SPECIFIER \*\* Polychem 850 is recommended for use at a dose of 1-20 fl. oz. per 100# (65 to 1305ml per 100kg) of cementitious material to meet the requirements of ASTM C 494 Type A water-reducing and Type F high-range water reducing admixture.

* + - 1. Dosage Rate: \_\_ oz. per cwt of cement.

\*\* NOTE TO SPECIFIER \*\* Polychem Paver Plus is a normal-setting, multi-component, highly concentrated water-reducing admixture. Polychem Paver Plus will reduce the quantity of water required to produce concrete of a desired consistency while providing greater economy for a given strength. It will increase strength and improve workability and finishing characteristics. Polychem Paver Plus does not contain calcium chloride, and is compatible with air-entrained and non-air-entrained mixes. Polychem Paver Plus was specifically designed for concrete slip-form paving operations to extend haul time and maintain workability. Delete if not required.

* + 1. Water-Reducing Admixture - Polychem Paver Plus:
       1. Product shall meet or exceed the requirements of ASTM C-494, Type A CRD C-87, ASHTO M-194.
       2. Product shall not contain calcium chloride, and is compatible with air-entrained or non-air-entrained mixes.
       3. Dosage Rate: 2 to 8 oz. per 100 lbs. cementitious material.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. WATERPROOFING ADMIXTURES

\*\* NOTE TO SPECIFIER \*\* Krystol Internal Membrane (KIM) is a chemical admixture in dry powdered form, effective in creating waterproof concrete. KIM is used in place of externally applied surface membranes to protect against moisture transmission, chemical attack and corrosion of reinforcing steel. When combined with fresh concrete, Kryton's unique and proven Krystol technology reacts with un-hydrated cement particles to form millions of needle-like crystals. Over a period of weeks and months, these crystals grow, filling the naturally occurring pores and voids in concrete, and permanently blocking the pathways for water and waterborne contaminants. Later, if cracks form due to settling or shrinkage, incoming water triggers the crystallization process and additional crystals form, filling cracks and ensuring that the structure's waterproofing barrier is maintained and protected. In addition to filling the pores and capillaries of the concrete matrix with crystals, KIM enhances the natural hydration process by intensifying and prolonging the hydration of the cementing materials. This reduces the size and number of capillary pores within the concrete matrix, making it dramatically less porous, and improving strength and durability characteristics. Delete if not required.

* + 1. Waterproofing Admixture for Concrete - Krystol Internal Membrane (KIM®):
       1. Product shall be used in place of externally applied surface membranes to protect against moisture transmission, chemical attack and corrosion of reinforcing steel.
       2. Product shall be certified for concrete drinking water containment by NSF International. NSF/ANSI Standard 61: Drinking Water System Components - Health Effects.
       3. KIM-HS: Used for most common applications. KIM-HS is compatible with common admixtures, such as plasticizers, accelerators, retarders and air-entrainers.
       4. KIM-AE: Used for concrete requiring air-entrainment to resist freezing and thawing cycles. Will increase air content by 3-5%. Adjustment or removal of any air-entraining admixtures is required.
       5. KIM-ES: Use in hot climates and mass concrete. KIM-ES will prolong the slump retention of the concrete and delay the initial setting time. Adjustment or removal of set retarding admixtures is required.

\*\* NOTE TO SPECIFIER \*\* MP-10 is a high-performance, efflorescence-reducing, water-repelling admixture for both wet- and dry-cast concrete applications. MP-10 dry and semi-dry applications include concrete masonry units, SRWs and pavers. MP-10 wet-cast applications include architectural precast and stone veneer. Delete if not required.

* + 1. Efflorescence Reducer / Water Repellent - MP-10
       1. Product shall be compatible with Portland cement, fly ash, slag (GGBFS), silica fume, fibers, air entraining or water reducing admixtures.

\*\* NOTE TO SPECIFIER \*\* Generally a total mix time of 90 seconds is required, and the mixing time after the introduction of MP-10 should be evaluated by trials. MP-10 can be added with the batching water or at the end of the mixing process. Do not add MP-10 onto dry cementitious materials as this will reduce the admixture performance.

* + - 1. Product is a low dose admixture and will require sufficient mixing time to be distributed throughout the entire batch resulting in uniform performance.

\*\* NOTE TO SPECIFIER \*\* To reduce efflorescence, a typical dosage range of 2 to 4 oz. / cwt (128 to 262 ml per 100 kg) will achieve the desired performance. Delete if not required.

* + - 1. Efflorescence Reduction:
         1. Dosage: \_\_\_ oz. / cwt.

\*\* NOTE TO SPECIFIER \*\* When water repellency is required, a typical dosage range of 4 to 8 oz. / cwt (256 -328 ml per 525 kg) will achieve the desired performance. Delete if not required.

* + - 1. Water Repellency:
         1. Dosage: \_\_\_ oz. / cwt.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   3. INSTALLATION
      1. Install in accordance with manufacturer's instructions and approved submittals.
   4. FIELD QUALITY CONTROL
      1. Test for proper dosage as recommended by manufacturer.
   5. PROTECTION
      1. Protect installed products until completion of project.
      2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION