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STATE OF INDIANA  
LAKE COUNTY  
FILED FOR RECORD

2007 033977

2007 APR 24 PM 1:46

Deed Reference: Document No. 2006-076983 **MICHAEL A. BROWN**  
**RECIPROCAL ACCESS, UTILITY, PARKING AND**  
**STORM DRAINAGE EASEMENT AGREEMENT**

This RECIPROCAL ACCESS, UTILITY, PARKING AND STORM DRAINAGE EASEMENT AGREEMENT, entered into this 23 day of April, 2007, by and between **Sisters of St. Francis Health Services, Inc. d/b/a St. Margaret Mercy Healthcare Centers**, (hereinafter referred to as First Party) and **Plum Creek Investments, LLC**, (hereinafter referred to as Second Party).

**WITNESSETH:**

WHEREAS, First Party is the owner in fee simple of that certain tract or parcel of real property located in the County of Lake and State of Indiana, a more particular description of which real property is set forth in Exhibit A, incorporated herein as if fully set forth (said parcel being hereinafter referred to as Parcel A); and

WHEREAS, Second Party is the owner in fee simple of that certain tract or parcel of real property located in the County of Lake and State of Indiana, a more particular description of which real property is set forth in Exhibit B, incorporated herein as if fully set forth (said parcel being hereinafter referred to as Parcel B); and

WHEREAS, First Party has improved Parcel A by constructing thereon buildings and other improvements; and

WHEREAS, Second Party intends to develop Parcel B as a commercial retail site and other improvements; and

WHEREAS, the parties hereto desire to enter into this Reciprocal Access, Utility, Parking and Storm Drainage Easement Agreement for the joint use of access and parking areas described as Parcel C (Access and Parking Area); for an electric and gas utility easement over the area described as Parcel D ("NIPSCO Easement"); and for a storm drainage easement on Parcel E ("Storm Drainage Easement");

NOW THEREFORE, in consideration of the mutual benefits to be realized by such joint use, the mutual agreements set forth herein, and other good and valuable considerations, the receipt and sufficiency of which are hereby acknowledged, the parties hereto do hereby agree as follows:

**FILED**

**005433**

**APR 24 2007**

Precision/1013.001411/Easement Agreement 04.11.07  
**REGGY HOLINGA KATONA**  
**LAKE COUNTY AUDITOR**

119 <sup>00</sup>  
P.D.M.  
2294  
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1. Second Party is hereby granted an easement to construct, install and maintain the improvements that are depicted on the Access and Parking Area set forth on Exhibit C, which improvements shall be approved by the Town of Schererville. In connection with the installation, maintenance, or repair of the improvements as provided in this paragraph, Second Party shall insure that such installation, maintenance, and repair is undertaken in a manner so as to minimize the affect on Parcel A and First Party. All such work shall be done promptly and in a good, workmanlike manner. Any portion of the parcels which are affected by such installation, maintenance, and/or repair shall be restored to the same condition as existed prior to such work, if appropriate. The work described in this paragraph shall not be deemed completed until approved, in writing by First Party, which approval shall not be unreasonably withheld or delayed.

2. Upon First Party's written approval of the completion of the Access and Parking Area, First Party does hereby establish, give, grant, and convey to Second Party, its respective successors, successors-in-title, and assigns, and the tenants, customers, employees, and invitees of such parties (Permittees), a non-exclusive easement appurtenant to Parcel B and adjacent property for ingress, egress and parking over and upon the Access and Parking Area. Upon First Party's approval of the completion of the Access and Parking Area, Second Party does hereby establish, give, grant, and convey to First Party, its successors, successors-in-title, and assigns and the tenants, customers, employees, and invitees of such parties (Permittees), a non-exclusive easement appurtenant to Parcel A for ingress and egress over and upon the paved portion of Parcel B adjoining the Access and Parking Area.

3. First Party does hereby establish, give, grant and convey to Second Party, its respective successors, successors in title, and assigns a non-exclusive easement appurtenant to Parcel B for the installation, maintenance or repair of utility lines over and upon the NIPSCO Easement set forth on Exhibit E to provide electrical and gas service to Parcel B. In connection with the installation, maintenance or repair of the utility lines as provided for in this paragraph, Second Party shall insure that such installations, maintenance, or repairs are undertaken in a manner so as to minimize the effect on Parcel A and First Party. All such work shall be done promptly and in a good workmanlike manner. Any portion of the parcels which are affected by such installation, maintenance, and/or repair shall be restored to the same condition that existed prior to such work, if appropriate.

4. Second Party is hereby granted an easement to construct, install and maintain storm water facilities upon the Storm Drainage Easement, which storm water facilities shall be approved by the Town of Schererville. The Storm Drainage Easement is composed of Detention Easement 1 and Detention Easement 2 as shown on Exhibit D. In connection with the installation, maintenance, or repair of storm water facilities as provided for in this paragraph, Second Party shall insure that such installations, maintenance, or repair is undertaken in a manner so as to minimize the effect on Parcel A and First Party. All such work shall be done promptly and in a good workmanlike manner. Any portion of the parcels which is affected by such installation, maintenance, and/or repair shall be restored to the same condition as existed prior to such work, if appropriate. First Party and Second Party hereby agree to enter into any dedication of the storm water facilities to the Town of Schererville or other appropriate governmental entity. The work on the storm water drainage facility described in this paragraph shall not be deemed completed until approved, in writing, by First Party, which approval shall not be unreasonably withheld or delayed. Second Party shall indemnify and hold harmless the First Party from and against all claims, liabilities and expenses

(including, without limitation, reasonable attorneys fees) relating to flooding that occurs on Parcel A as a result of the stormwater drainage from Parcel B, excluding those matters arising from the negligence of the First Party and its permittees.

5. Upon First Party's written approval of the completion of the Storm Drainage Easement, First Party does hereby establish, give, grant and convey to Second Party, its respective successors, successors-in-title, and assigns a non-exclusive easement appurtenant to Parcel B for storm water drainage and facilities over and upon the Storm Drainage Easement, and Second Party does hereby establish, give, grant, and convey to First Party, its respective successors, successors in title, and assigns a non-exclusive easement pertinent to Parcel A for storm water drainage and facilities over and upon the Storm Drainage Easement.

6. Upon First Party's approval of the improvements to Parcel E, that shall not be unreasonably withheld or delayed ("Approval Date"), Second Party shall within fifteen (15) days of such approval make a payment of Fifteen Thousand Dollars (\$15,000.00) to First Party, and thereafter on each anniversary of the Approval Date, Second Party shall make subsequent annual payments of Fifteen Thousand Dollars (\$15,000.00) to First Party as consideration for the perpetual easements granted pursuant to the terms hereunder. First Party shall have no duty to invoice Second Party for such payments. Second Party's obligations under this provision shall be binding on Second Party's successors and assigns and shall run with the land. In the event Second Party fails to make one or more of the payments described in this paragraph, First Party shall send Second Party written notice of such failure and a demand for payment. If Second Party fails to make the payment demanded within thirty (30) days after receipt of the same by Second Party, First Party may enforce a lien in the amount of the written demand against Parcel B, such lien to be evidenced by a certified claim recorded in the Office of the Recorder of Lake County, Indiana and before enforcement a copy of such claim shall be mailed by registered or certified mail to Second Party. No action for the enforcement of such lien shall be commenced until the expiration of twenty (20) days for the date of recording and mailing of such certified claim.

7. In connection with the grant of the easements contained herein, and in order to make such easements effective for the purposes contained, First Party and Second Party do further agree as follows:

- (a) All improvements to be constructed in Parcel C, Parcel D and Parcel E pursuant to the attached Exhibits C and D, shall be constructed by the Second Party, at its sole cost and expense.
- (b) No party hereto shall, at any time prior to the termination of the easements herein granted, erect or construct, or cause to be erected or constructed any barrier or in any manner interfere with or restrict the full and complete use and enjoyment of the easements herein granted.
- (c) After the construction of the improvements in Parcel C, Parcel D and Parcel E and approval by the First Party, all improvements, equipment, driveways and landscaping in Parcel C, Parcel D and Parcel E shall be maintained by the Second Party at its sole cost and expense. The Storm Drainage Easement shall be maintained by appropriate mowing of vegetation, removal of trees and brush, and periodic removal of all foreign materials and debris to insure proper drainage to the lift station. The lift station pumps and standby generators that are part of the Storm Drainage Easement

- will be maintained by the Second Party at its sole cost and expense pursuant to the attached specifications, Exhibit H, incorporated herein as though fully set forth.
- (d) In connection with the installation, maintenance, or repair of improvements and utilities as provided for in this Agreement, the Second Party shall insure that such installations, maintenance, or repair is undertaken in a manner so as to minimize the effect on the First Party. All such work shall be done promptly and in a good, workmanlike manner. Any portion of the parcels which is affected by such installation, maintenance, and/or repair shall be restored to the same condition as existed prior to such work, if appropriate.
  - (e) This Agreement in no way obligates the Second Party to construct any improvements if the project is abandoned prior to commencement of construction, and if the project is abandoned prior to commencement of construction, the Second Party and First Party have no obligations hereunder. If the Second party abandons the project after commencement of construction of work on Parcels C, D, or E, Second Party shall promptly restore such parcels to their pre-construction condition.
  - (f) Second Party shall be responsible to prepare all engineering drawings for Parcels C, D and E, which shall be subject to the approval of First Party's engineer, which approval shall not be unreasonably withheld or delayed. First Party has approved of the complete engineering documents attached hereto. In the event of any dispute between First Party and Second Party concerning any material changes to the engineering drawings, the parties shall mutually agree upon an arbitrator and if they are not able to mutually agree, each party shall choose one arbitrator and such arbitrators shall choose one additional arbitrator, and the dispute shall be determined by the arbitrator or a majority of the arbitrators. The parties agree to expedite the resolution of any dispute pursuant to the Arbitration Rules for the Real Estate Industry, as amended and effective September 15, 2005 as published by the American Arbitration Association®.
  - (g) Second Party shall indemnify and hold harmless the First Party from and against all claims, liabilities and expenses (including, without limitation, reasonable attorneys fees) relating to accidents, injuries, loss, or damage of or to any person or property arising from or in any manner relating to the construction of improvements by Second Party pursuant to the grant of easements contained in this Agreement, including those matters arising from the alleged negligence of the First Party and its Permittees.
  - (h) Second Party agrees to locate its dumpsters on Parcel B as depicted in the attached Exhibit F, and such areas shall have the aesthetic barriers set forth on Exhibit F installed according to that Exhibit.
  - (i) Second Party agrees to a one-time clean up of approximately Seven Hundred Sixty Five feet (765') of drainage ditch adjacent to Parcel A and Parcel B and One Thousand Five Hundred feet (1505') to the north thereof, to the extent permission is granted from the owners thereof, as depicted on Exhibit G for the purposes of maintaining proper storm drainage for Parcel A and Parcel B. Second Party agrees to maintain such ditch adjacent to Parcel A and Parcel B thereafter, at its sole cost and expense, for proper storm drainage after this Agreement is executed. Maintenance of the 765' of ditch immediately adjacent to Parcel A and Parcel B shall be at least six (6) times each year and will include the removal of brush and trees and mowing of vegetation to permit the normal flow of drainage water.

Maintenance shall satisfy the design criteria shown on the Torrenga Engineering drawing C4.0 dated July 28, 2006, included as a part of Exhibit G.

8. In the event First Party reasonably determines that Second Party is not so maintaining or repairing Parcel C, Parcel D and/or Parcel E, First Party shall give written notice to Second Party and Second Party shall have thirty (30) days from receipt of such notice to cure such unperformed work (unless Second Party shall have commenced the work and such work will reasonably take more than thirty (30) days to be completed, in which case Second Party shall have such additional time as may be reasonably necessary). In the event Second Party fails to perform such work within such thirty (30) day period (or such additional time as shall be reasonably necessary if Second Party is diligently pursuing the completion of such work), First Party shall have the right, upon the giving of thirty (30) days written notice, to perform such work and invoice Second Party the reasonable cost and expenses of performing such work. In the event Second Party fails to pay such invoice within thirty (30) days after receipt of the same by Second Party, First Party may enforce a lien in the amount of the invoice against Parcel B, such lien to be evidenced by a certified claim recorded in the Office of the Recorder of Lake County, Indiana and before enforcement a copy of such claim shall be mailed by registered or certified mail to Second Party. No action for the enforcement of such lien shall be commenced until the expiration of twenty (20) days from the date of recording and mailing of such certified claim.

9. A. As long as there is no uncured default under this Agreement by First Party, Second Party covenants and agrees that, from and after the date hereof, Second Party shall not lease space in Parcel B to any tenant under which such tenant is permitted to use its premises for purposes of a fitness center, except as may be incidental to another permitted use and shall not involve the use of more than ten percent (10%) of such tenant's premises. Further, Second Party shall not directly or indirectly engage in the business of owning or operating a fitness center on Parcel B. Second Party's obligations under this provision shall be binding on Second Party's successors and assigns and shall run with the land. Second Party's obligations under this provision shall expire upon the earlier of (i) the termination of this Agreement; or (ii) the permanent discontinuance of the principal use of the First Party's property as a fitness center.

B. In addition, as long as there is no uncured default under this Agreement by First Party, Second Party covenants and agrees that, from and after the date hereof, Second Party shall not lease space in Parcel B to any tenant under which such tenant is permitted to use its premises for the purposes of a Prohibited Use, and shall not directly or indirectly engage in the business of owning or operating a Prohibited Use on Parcel B. Second Party's obligations under this provision shall be binding on Second Party's successors and assigns and shall run with the land. Second Party's obligations under this provision shall expire on the earlier of (i) the termination of this Agreement or (ii) First Party or an affiliate no longer owning Parcel A. "Prohibited Uses" shall mean and include: a clinic or facility that performs abortions, direct sterilization, or euthanasia; a contraceptive clinic; or, a use for any other purpose whatsoever that contravenes the Ethical and Religious Directives for Catholic Health Care Services, as promulgated by the U.S. Conference of Catholic Bishops from time-to-time.

10. The easements, restrictions, and agreements provided for herein shall be effective upon First Party's written approval of the improvements, all as described above and the satisfaction of the conditions herein. The easements provided for herein shall run with the land and shall

constitute a use for reciprocal benefits to and burdens upon Parcel A and Parcel B. The easements and agreements provided for herein shall inure to the benefit of and be binding upon the respective successors, successors-in-title, assigns, heirs, tenants of each party hereto and the Permittees, and shall remain in full force and effect and shall be unaffected by any change in ownership of Parcel A and Parcel B, or by any change of use, demolition, reconstruction, expansion, or other circumstances, except as specified herein. The agreement and undertakings by each party hereto shall be enforceable by action for specific performance, it being agreed by both parties hereto that an action for damages would not be an adequate remedy for a breach of this Agreement. Nothing in this paragraph is intended to nor shall it be implied or interpreted to limit First Party's rights under this Agreement or other legal or equitable remedies.

11. This Agreement is not intended to, and should not be construed to dedicate said easement areas to the general public, nor shall this instrument be construed to restrict the use and development of Parcel A or Parcel B, except as stated herein. Without limiting the generality of the foregoing and subject to the limitations contained herein, First Party and Second Party shall have the right to expand, alter, modify, or demolish all or part of the buildings that exist or that they propose to construct on Parcel A and Parcel B or develop said parcels in any manner they see fit, it being the intent of this instrument to grant reciprocal easements over Parcels C, D and E without limiting the right of First Party or Second Party to alter, demolish, or redevelop other areas.

12. This Agreement shall be recorded at the Office of the Recorder of Lake County, Indiana and shall be prior in title to any mortgage which is now or may hereafter be placed upon any of Parcel A and Parcel B.

13. This Easement shall endure perpetually and shall run with the land and this Easement is made expressly for the benefit of and shall be binding on the successors in interest and assigns of the respective parties.

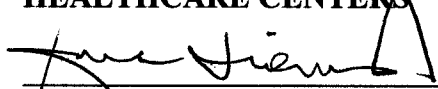
14. The rule of strict construction does not apply to this Agreement. This Agreement shall be given reasonable construction so that the intention of the parties to grant and obtain a commercially usable easement is carried out.

15. If it shall, at any time, be held that any of the provisions of this instrument or any part thereof are invalid or for any reason become unenforceable, no other provision or part thereof shall hereby be affected or impaired.

16. Each owner having the rights with respect to the easements granted hereunder shall indemnify and hold the other party whose parcel is subject to the easement harmless from and against all claims, liabilities and expenses (including, without limitation, reasonable attorneys fees) relating to accidents, injuries, loss, or damage of or to any person or property arising from or in any manner relating to the use by the indemnifying owner or its Permittees of any easement granted hereunder except as may result from the gross negligence or intentional misconduct of the owner whose parcel is subject to the easement or its Permittees.

IN WITNESS WHEREOF, the parties hereto have executed this Reciprocal Access, Parking and Storm Drainage Easement Agreement under seal as of the date first written.

**SISTERS OF ST. FRANCIS HEALTH SERVICES, INC. d/b/a MARGARET MERCY HEALTHCARE CENTERS**



**Gene Diamond, Chief Executive Officer,  
Northern Indiana Region**

**PLUM CREEK INVESTMENTS, LLC**



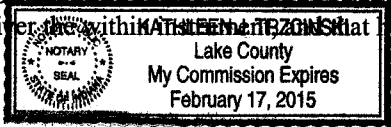
By: \_\_\_\_\_

Its: \_\_\_\_\_



STATE OF Indiana )  
COUNTY OF Lake ) SS:

Personally appeared before me, the undersigned witness, whose name is subscribed above, who on oath states that he/she saw the within named Gene Diamond, as Regional Chief Executive Officer for the Northern Indiana Region of Sisters of St. Francis Health Services, Inc. d/b/a St. Margaret Mercy Healthcare Centers acknowledge, sign, seal and deliver the within instrument, and that he/she witnessed the execution thereof.



Kathleen S. Trzinski  
Notary Public  
Printed: Kathleen S. Trzinski

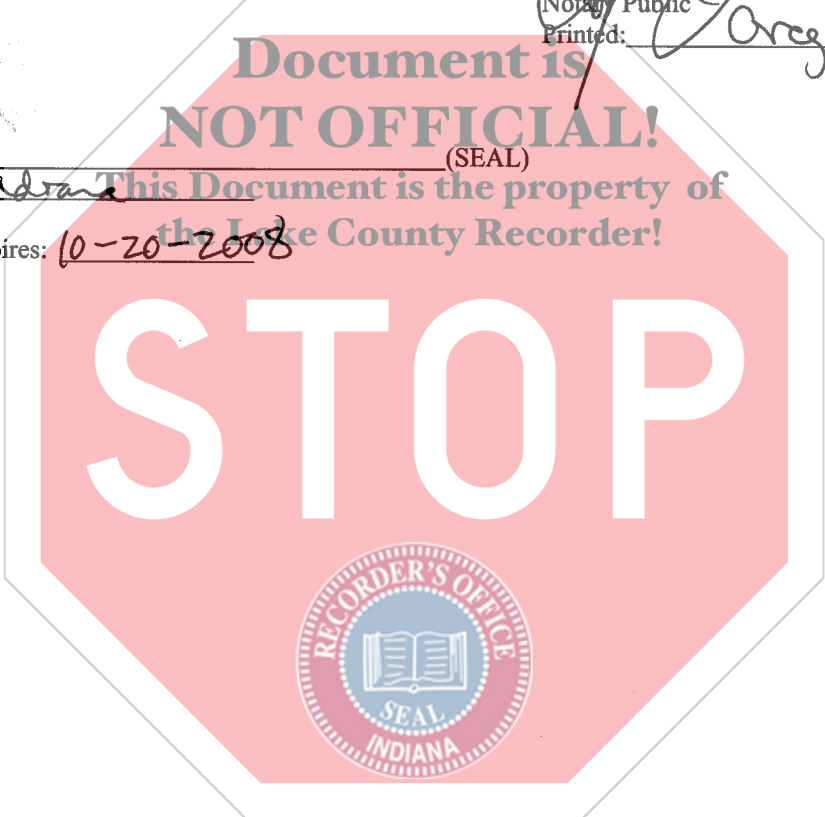
STATE OF Indiana )  
COUNTY OF Lake ) SS:

Personally appeared before me, the undersigned witness, whose name is subscribed above, who on oath states that he/she saw the within named Dwight Vanduyke as President of Plum Creek Investments, LLC acknowledge, sign, seal and deliver the within instrument, and that he/she witnessed the execution thereof.

[Signature]  
Notary Public  
Printed: Oreg A. Bowers

Document is NOT OFFICIAL!  
(SEAL)

Notary Public for Indiana This Document is the property of the Lake County Recorder!  
My Commission Expires: 10-20-2008





**EXHIBIT A**

**PARCEL A**

The South Half of the Southwest Quarter of the Northwest Quarter of Section 4, Township 35 North, Range 9 West of the Second Principal Meridian, except therefrom the lands conveyed to Indiana Harbor Railroad by deed recorded August 8, 1902 in Deed Record 93, page 302 and to Chicago Indiana and Southern Railroad by Deed recorded October 20, 1908 in Deed Record 137, page 313, in the Town of Schererville, Lake County, Indiana leaving after said execution a tract more particularly described as: Beginning at the Southwest corner of the Northwest Quarter of said Section 4, which is a point 2,633.47 feet North of the Southwest corner of said Section 4 and 2,886.89 feet South of the Northwest corner of said Section 4, measured along the West line of said Section 4; thence Easterly along the South line of the Northwest Quarter, 1,229.43 feet to the West line of the Chicago, Indiana and Southern Railroad 180 foot right of way owned and described in Deed Record 93, page 302 and Deed Record 137, page 313 in Lake County, Indiana; thence Northerly on said West line of the real estate described in said Deed Record 137, page 313, a distance of 658.70 feet to the North line of the South half of the Southwest Quarter of the Northwest Quarter of said Section 4; thence Westerly on said North line of the South half 1,233.58 feet to the West line of said Section 4; thence Southerly on said Westerly line 658.36 feet to the point of beginning, in Lake County, Indiana. EXCEPTING THEREFROM THAT PART OF THE ABOVE DESCRIBED LAND CONVEYED TO THE STATE OF INDIANA FOR U.S.R. 41 RECORDED NOVEMBER 6, 2001 as Document No. 2001-089277 FOR HIGHWAY PURPOSES.



**EXHIBIT B**

**PARCEL B**

Lot 1, Omni 41, First Addition, recorded in Plat Book 77, page 76 in the Lake County Recorder's Office.



**EXHIBIT C**

**ACCESS AND PARKING AREA**



Description of Cross Access and Parking Easement on OMNI Property

Description: Being an easement for vehicular cross access and parking, lying on a parcel of land within and adjacent to Lot 1, OMNI 41, First Addition as recorded in Plat Book 77, page 76 in the Office of the Recorder of Lake County, Indiana, more particularly described as follows: Commencing at the Southeast corner of said Lot 1; thence N 89°45'01" W (Recorded as N 89°03'28" W) along the South line of said Lot 1, a distance of 258.94 feet to the point of beginning; thence continuing N 89°45'01" W along the South line of said Lot 1 and said line extended, a distance of 926.80 feet (recorded as 926.37 feet) to the East right-of-way line of US Highway No. 41, said point lying 47.84 feet East of the West line of Section 4, Township 35 North, Range 9 West of the 2<sup>nd</sup> P.M.; thence N 00°41'15" W (recorded as N 00°00'18" E) along said East right-of-way line, a distance of 63.56 feet; thence S 44°57'20" E, a distance of 49.74 feet; thence S 89°57'15" E, a distance of 63.75 feet to a point of curve; thence Northwesterly along a curve concave to the Northwest and having a radius of 18.50 feet, an arc distance of 29.06 feet; thence N 00°02'58" E, a distance of 40.00 feet; thence S 89°57'15" E, a distance of 767.25 feet; thence S 00°59'48" W, a distance of 59.48 feet; thence N 89°42'15" E, a distance of 6.89 feet; thence S 51°03'21" E, a distance of 36.53 feet to a point of curve; thence Southeasterly along a curve concave to the Southwest and having a radius of 160.50 feet, an arc distance of 11.00 feet to the point of beginning, all in the Town of Schererville, Lake County, Indiana.



**Description of Access Easement on Village Crossroads Property**

Description: Being an easement for vehicular cross access, lying on a parcel of land South of and adjacent to Lot 1, OMNI 41, First Addition as recorded in Plat Book 77, page 76 in the Office of the Recorder of Lake County, Indiana, more particularly described as follows: Commencing at the Southeast corner of said Lot 1; thence N 89°45'01" W (Recorded as N 89°03'28" W) along the South line of said Lot 1, a distance of 258.94 feet to the point of beginning; thence continuing N 89°45'01" W along the South line of said Lot 1 and said line extended, a distance of 904.00 feet to the East right-of-way line of US Highway No. 41, said point lying 70.64 feet East of the West line of Section 4, Township 35 North, Range 9 West of the 2<sup>nd</sup> P.M.; thence S 00°43'34" E along said right-of-way line, a distance of 14.41 feet; thence N 85°54'43" E, a distance of 137.57 feet; thence S 89°45'01" E, a distance of 770.25 feet; thence Northwesterly along a curve concave to the Southwest and having a radius of 160.50 feet (the chord of which curve bears N 42°26'35" W, a chord distance of 5.44 feet), an arc distance of 5.44 feet to the point of beginning, all in the Town of Schererville, Lake County, Indiana.



**EXHIBIT  
PROPOSED CROSS-ACCESS, PARKING AND DETENTION EASEMENTS  
OMNI 41 AND VILLAGE CROSSROADS**

**Description of Proposed Easement on OMNI Property (ACCESS EASEMENT 1)**  
 Description: This easement is proposed for the purpose of providing access to the proposed building on the east side of the property. The easement is shown as a shaded area along the boundary between the subject property and the property owned by the State of Indiana. The easement is 10 feet wide and extends the full length of the property. The easement is subject to the terms and conditions set forth in the plat.

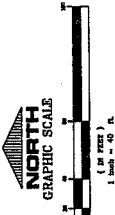
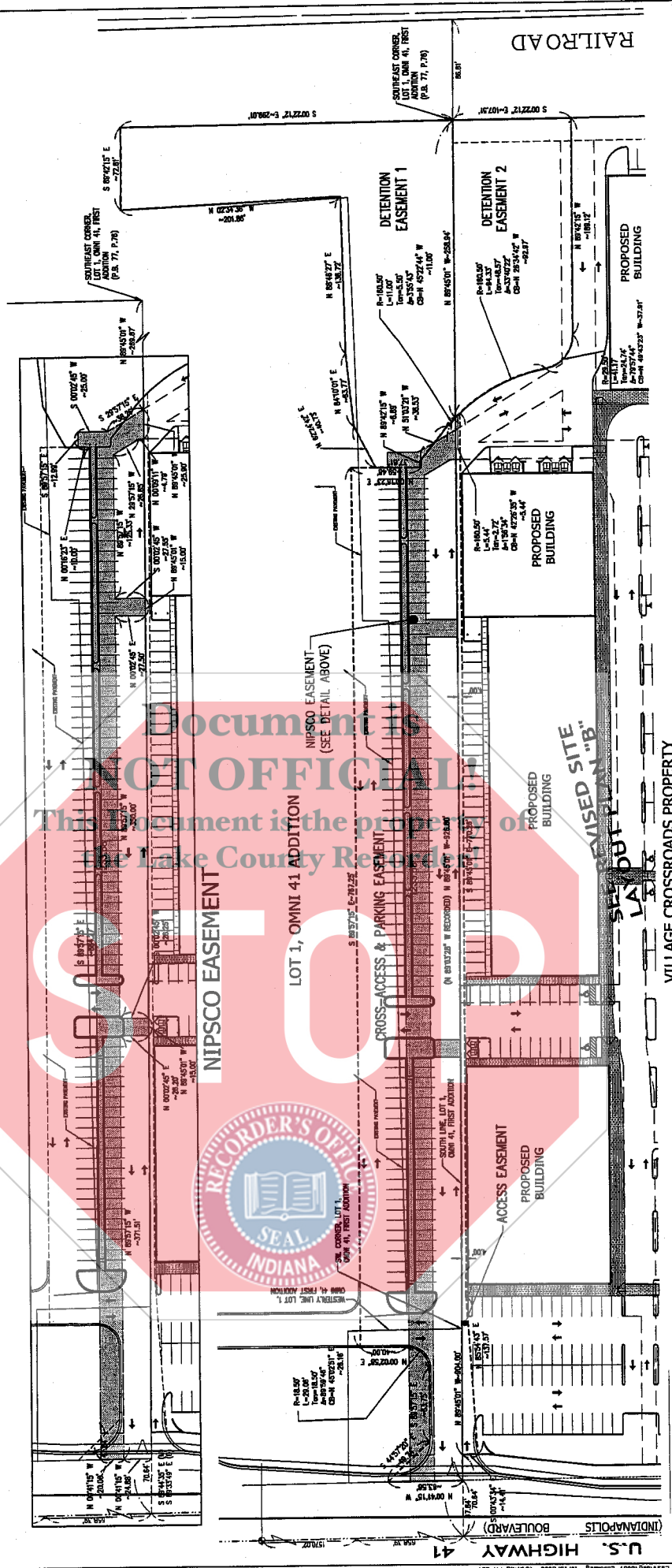
**Description of Other Adjacent Property (ACCESS EASEMENT 2)**  
 Description: This easement is proposed for the purpose of providing access to the proposed building on the east side of the property. The easement is shown as a shaded area along the boundary between the subject property and the property owned by the State of Indiana. The easement is 10 feet wide and extends the full length of the property. The easement is subject to the terms and conditions set forth in the plat.

**Description of Other Adjacent Property (ACCESS EASEMENT 3)**  
 Description: This easement is proposed for the purpose of providing access to the proposed building on the east side of the property. The easement is shown as a shaded area along the boundary between the subject property and the property owned by the State of Indiana. The easement is 10 feet wide and extends the full length of the property. The easement is subject to the terms and conditions set forth in the plat.

**Description of Other Adjacent Property (ACCESS EASEMENT 4)**  
 Description: This easement is proposed for the purpose of providing access to the proposed building on the east side of the property. The easement is shown as a shaded area along the boundary between the subject property and the property owned by the State of Indiana. The easement is 10 feet wide and extends the full length of the property. The easement is subject to the terms and conditions set forth in the plat.

**Description of Other Adjacent Property (ACCESS EASEMENT 5)**  
 Description: This easement is proposed for the purpose of providing access to the proposed building on the east side of the property. The easement is shown as a shaded area along the boundary between the subject property and the property owned by the State of Indiana. The easement is 10 feet wide and extends the full length of the property. The easement is subject to the terms and conditions set forth in the plat.

**Description of Other Adjacent Property (ACCESS EASEMENT 6)**  
 Description: This easement is proposed for the purpose of providing access to the proposed building on the east side of the property. The easement is shown as a shaded area along the boundary between the subject property and the property owned by the State of Indiana. The easement is 10 feet wide and extends the full length of the property. The easement is subject to the terms and conditions set forth in the plat.



**TORRENGA ENGINEERING, INC.**  
 CONSULTING ENGINEERS & LAND SURVEYORS  
 907 RIDGE ROAD, MUNSTER, INDIANA 46321  
 Tel. No.: (219) 834-8818  
 website: www.torrenga.com

**EXHIBIT**  
 Proposed Cross-Access, Parking  
 and Detention Easements  
 OMNI 41 and Village Crossroads

10-18-2008 LEGALS  
 10-29-2008 REVISIONS  
 DATE: 08-28-2008

CLIENT:  
 Precision Construction  
 Highland, Indiana 46322

JOB NO: 0007-2008  
 SCALE: 1" = 40'

FILE NO: Village Crossroads East (10/18/2007-2008) 10/18/2008 12/27/08 PM CRT

SHEET 1 OF 1

**EXHIBIT D**  
**STORM DRAINAGE EASEMENT**



## Description of Detention Easement on OMNI Property

Description: Being an easement for detention of storm water, lying on a parcel of land within Lot 1, OMNI 41, First Addition as recorded in Plat Book 77, page 76 in the Office of the Recorder of Lake County, Indiana, more particularly described as follows:

Beginning at the Southeast corner of said Lot 1; thence N 89°45'01" W (Recorded as N 89°03'28" W) along the South line of said Lot 1, a distance of 258.94 feet; thence Northwesterly along a curve concave to the Southwest and having a radius of 160.50 feet (the chord of which curve bears N 45°22'44" W, a chord distance of 11.00 feet), an arc distance of 11.00 feet; thence N 51°03'21" W, a distance of 36.53 feet; thence N 89°42'15" W, a distance of 6.89 feet; thence N 00°16'23" E, a distance of 59.48 feet; thence N 62°24'42" E, a distance of 40.73 feet; thence N 84°10'01" E, a distance of 63.77 feet; thence N 88°46'27" E, a distance of 136.72 feet; thence N 02°34'36" W, a distance of 201.86 feet; thence S 89°42'15" E, a distance of 72.81 feet to the East line of said Lot 1; thence S 00°22'12" E (recorded as S 00°00'08" E) along said East line, a distance of 299.01 feet to the point of beginning, all in the Town of Schererville, Lake County, Indiana.





**Description of Detention Easement on Village Crossroads Property**

Description: Description: Being an easement for detention of storm water, lying on a parcel of land South of and adjacent to Lot 1, OMNI 41, First Addition as recorded in Plat Book 77, page 76 in the Office of the Recorder of Lake County, Indiana, more particularly described as follows: Beginning at the Southeast corner of said Lot 1; thence S 00°22'12" E, along the West line of the Norfolk & Southern Railroad right-of-way, a distance of 107.51 feet; thence N 89°42'15" W, a distance of 189.12 feet to a point of curve; thence Northwesterly along a curve concave to the Northeast and having a radius of 29.50 feet, an arc distance of 41.17 feet to a point of reverse curve; thence Northwesterly along a curve concave to the Southwest and having a radius of 160.50 feet, an arc distance of 94.33 feet to the South line of said Lot 1; thence S 89°45'01" E (recorded as S 89°03'28" E), a distance of 258.94 feet to the point of beginning, all in the Town of Schererville, Lake County, Indiana.



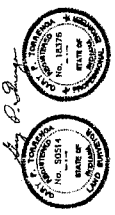
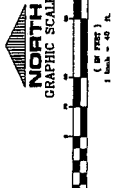
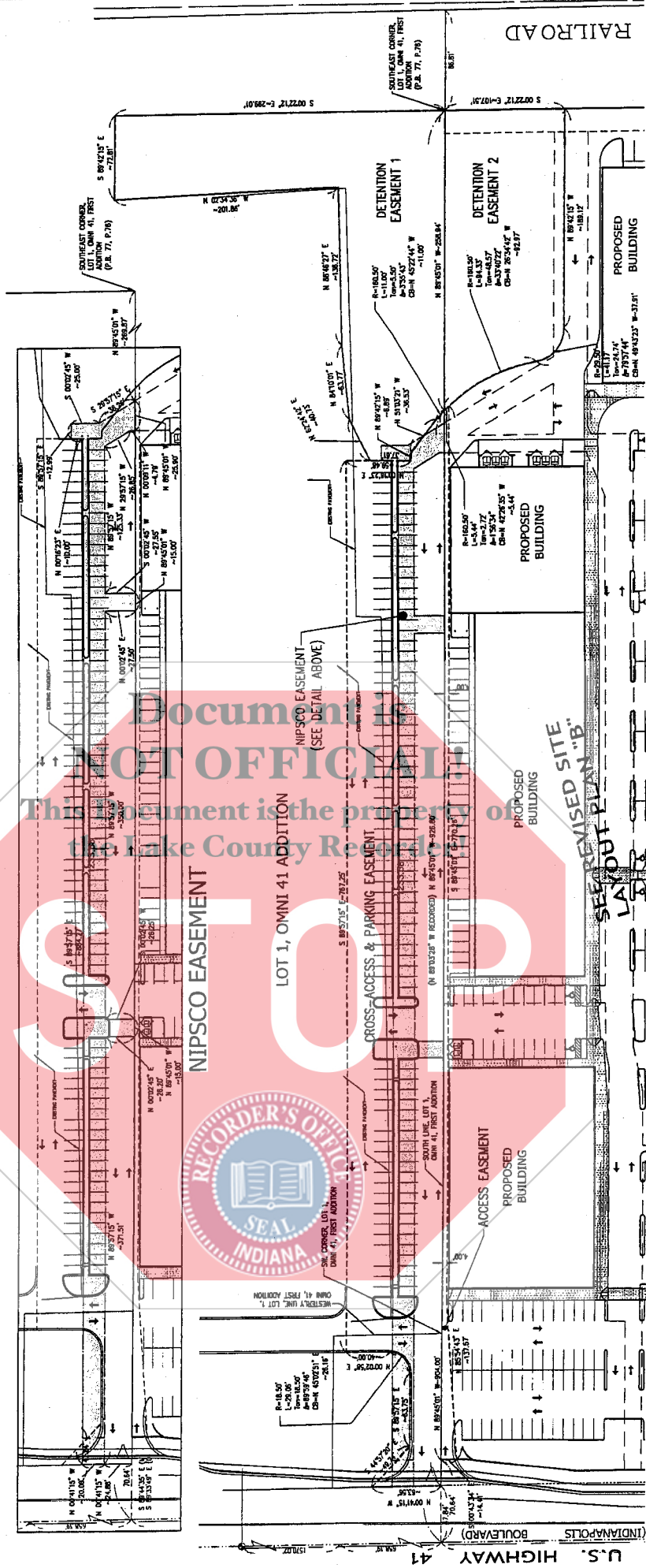
**EXHIBIT  
PROPOSED CROSS-ACCESS, PARKING AND DETENTION EASEMENTS  
OMNI 41 AND VILLAGE CROSSROADS**

**DESCRIPTION OF PROPERTY**  
Description of Property as shown on OMNI Property  
CONVEYANCE RECORDATION (1/2/2008)  
Description of Property as shown on OMNI Property  
CONVEYANCE RECORDATION (1/2/2008)  
Description of Property as shown on OMNI Property  
CONVEYANCE RECORDATION (1/2/2008)

**DESCRIPTION OF PROPERTY**  
Description of Property as shown on OMNI Property  
CONVEYANCE RECORDATION (1/2/2008)  
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CONVEYANCE RECORDATION (1/2/2008)

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Description of Property as shown on OMNI Property  
CONVEYANCE RECORDATION (1/2/2008)  
Description of Property as shown on OMNI Property  
CONVEYANCE RECORDATION (1/2/2008)

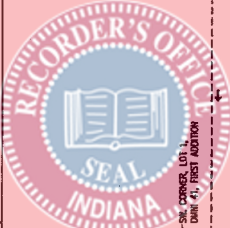
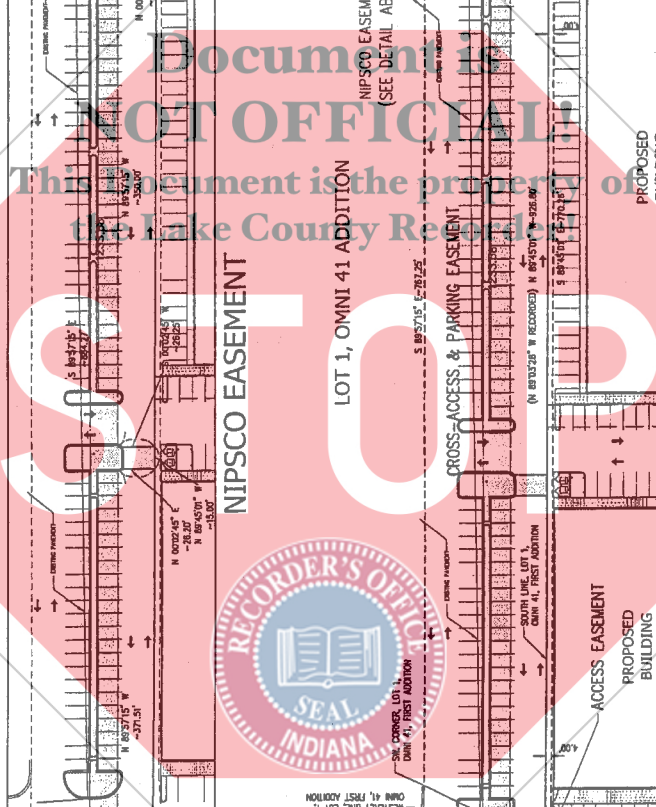


PROJECT  
SBEI Interstate Blvd  
Highway, Indiana 46332  
JOB NO. 007-2008  
SCALE: 1" = 40'  
DATE: 06-26-2008

EXHIBIT  
Proposed Cross-Access, Parking  
and Detention Easements  
OMNI 41 and Village Crossroads

**TORRENGA ENGINEERING, INC.**  
CONSULTING ENGINEERS & LAND SURVEYORS  
907 RIDGE ROAD, MUNSTER, INDIANA 46321  
Tel. No.: (831) 830-8818  
Website: www.torrena.com

**TE**  
SHEET  
1  
OF  
1



**EXHIBIT E**  
**NIPSCO EASEMENT**



Description of NIPSCo Easement on OMNI Property

Description: Being an easement for gas and electric utility installation, lying on a parcel of land within and adjacent to Lot 1, OMNI 41, First Addition as recorded in Plat Book 77, page 76 in the Office of the Recorder of Lake County, Indiana, more particularly described as follows: Commencing at the Southeast corner of said Lot 1; thence N 89°45'01" W (Recorded as N 89°03'28" W) along the South line of said Lot 1, a distance of 269.87 feet to the point of beginning; thence continuing N 89°45'01" W along the last described line, a distance of 25.90 feet; thence N 00°09'11" W, a distance of 4.79 feet; thence N 29°57'15" W, a distance of 26.85 feet; thence N 89°57'15" W, a distance of 125.33 feet; thence S 00°02'45" W, a distance of 27.55 feet to said South line; thence N 89°45'01" W along said South line, a distance of 15.00 feet; thence N 00°02'45" E, a distance of 27.50 feet; thence N 89°57'15" W, a distance of 350.00 feet; thence S 00°02'45" W, a distance of 26.25 feet to said South line; thence N 89°45'01" W along said South line, a distance of 15.00 feet; thence N 00°02'45" E, a distance of 26.20 feet; thence N 89°57'15" W, a distance of 371.55 feet to the East right-of-way line of US Highway No. 41; thence N 00°41'15" W (recorded as N 00°00'18" E) along said right-of-way line, a distance of 20.00 feet; thence S 89°57'15" E, a distance of 884.27 feet; thence N 00°16'23" E, a distance of 10.00 feet; thence S 89°57'15" E, a distance of 12.99 feet; thence S 00°02'45" W, a distance of 25.00 feet; thence S 29°57'15" E, a distance of 38.26 feet to the point of beginning, all in the Town of Schererville, Lake County, Indiana.





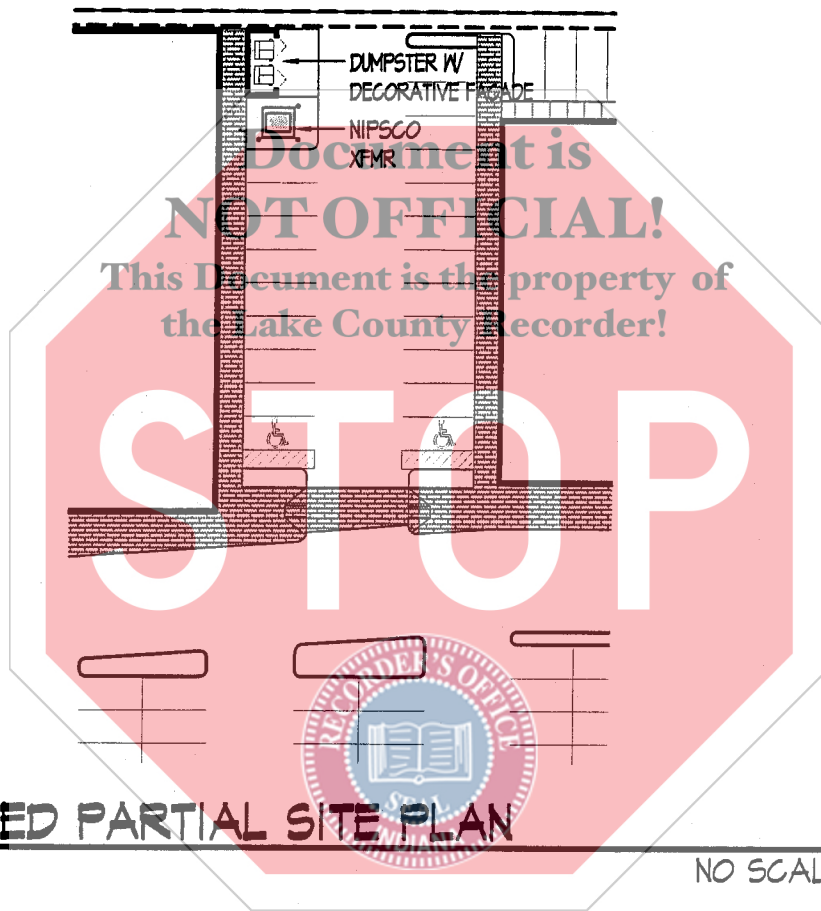
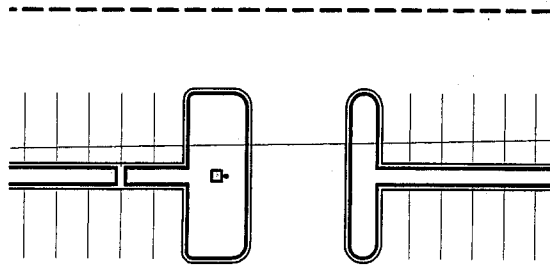
**EXHIBIT F**

**DUMPSTER LOCATION**



N ↑

Lot 1, Omni Addition



**PROPOSED PARTIAL SITE PLAN**

EXHIBIT "F"  
4/18/07

NO SCALE



NOTE:

ALL DUMPSTER ENCLOSURE OPENINGS SHALL FACE EAST,  
SOUTH OR WEST REGARDLESS OF FINAL BUILDING  
LOCATIONS OR ORIENTATIONS.

**EXHIBIT G**

**DRAINAGE DITCH MAINTENANCE**

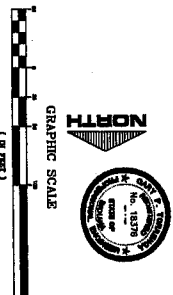




VILLAGE CROSSROADS EAST



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CLIENT:  
 Precision Construction  
 9816 Indianapolis Blvd.  
 Highland, Indiana 46322

JOB NO: 5067-2006

09-15-2006

REVISIONS:

DATE: 07-29-2006

SCALE: 1" = 50'

SHEET  
 C4.0

VILLAGE CROSSROADS EAST

PROPOSED  
 REGRADE OF RAILROAD DITCH

TORRENGA ENGINEERING, INC.  
 CONSULTING ENGINEERS & LAND SURVEYORS  
 907 RIDGE ROAD, MUNSTER, INDIANA 46321

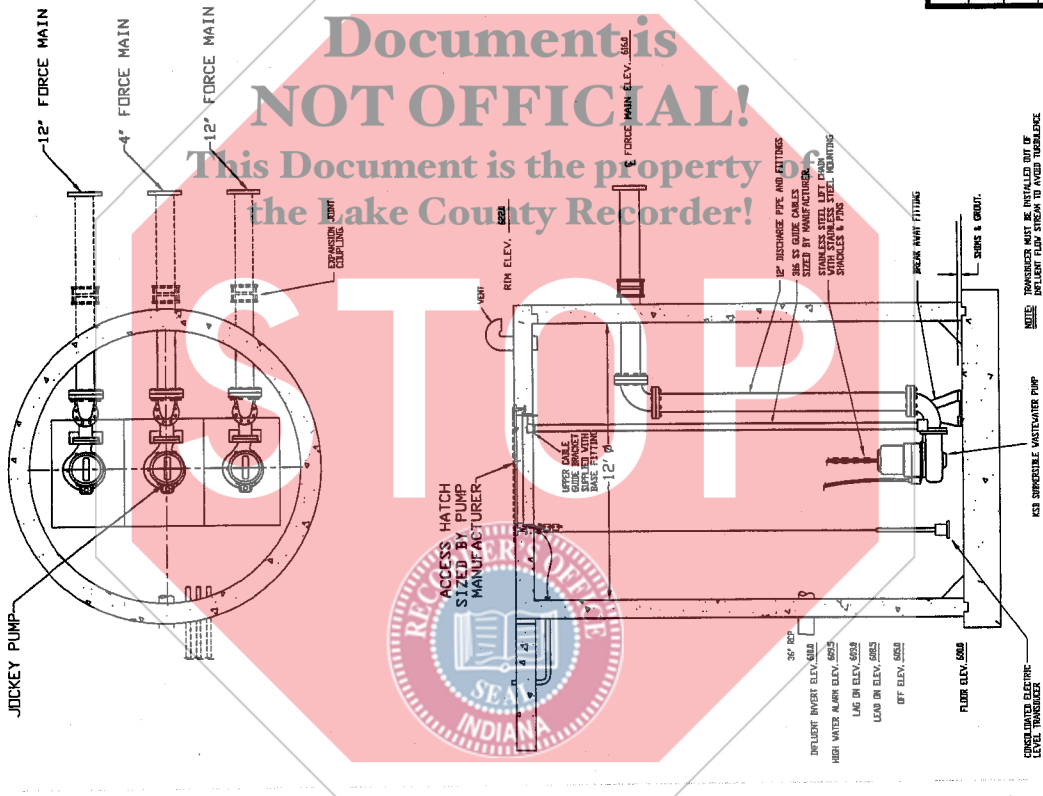
Tel. No.: (219) 896-8818 website: www.torrenge.com

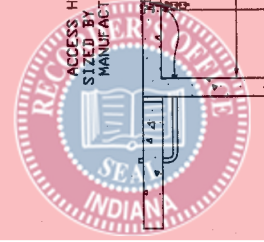


**EXHIBIT H**

**TECHNICAL SPECIFICATIONS AND PUMP INFORMATION**





**Document is NOT OFFICIAL!**  
 This Document is the property of the Lake County Recorder!  


**INCOMING SERVICE**

VOLTS 480  
 AMPS NIFSCO  
 PHASE 3  
 HERTZ 60  
 WIRE 3

**NOTES**

1. ALL ELECTRICAL MOTORS & WIRING SHALL COMPLY WITH THE CURRENT NATIONAL ELECTRIC CODE EDITION.
2. SEE MANUFACTURER'S DRAWING FOR BASE FITTING AND PUMP LAYOUT DIMENSIONS.



Equipment			
KSB TRIPLEX SUBMERSIBLE LIFT STATION			
Job	Sheet	Page	Sheet
SHERERVILLE, IN. VILLAGE CROSSROAD STORM LIFT STATION	7/24/06	LVO	1 of 1
Job Number	Date	Rev	Scale
7/24/06	7/24/06	LVO	
Proj. Engineer	Designer	Checker	Scale
V. PUMPS/STAFF/SUBMERSIBLES/VE08833			

**Gasvoda & Associates, Inc.**  
 1630 Huntington Dr., Calumet City, IL, 60409  
 Phone: 708-891-4400 Fax: 708-891-6786

VILLAGE CROSSROADS, SCHERERVILLE IN  
SUBMERSIBLE PUMPING STATION  
TECHNICAL SPECIFICATION

**1.00 GENERAL:**

A. The contractor shall furnish one automatic submersible pump station, with all needed equipment installed in a concrete wet well with separate valve vault. The principal items of equipment shall include two (2) submersible non-clog sewage pumps, one (1) storm water "Jockey" pump, slide away couplings, guide cable system, piping and access covers.

B. OPERATING CONDITIONS  
***PRIMARY STORM WATER PUMPS***

Design Flow (GPM)	<u>2131</u>
Design Head (FT)	<u>15</u>
Horsepower	<u>10</u>
Minimum Efficiency(%)	<u>80</u>
Speed (RPM)	<u>1160</u>
Voltage	<u>3/60/460</u>
Discharge Size (IN)	<u>8</u>
Manufacturer	<u>KSB</u>
Pump Model	<u>KRT-K200-280/96U</u>
Solids Handling Size	<u>2.75</u>

***JOCKEY PUMP***

Design Flow (GPM)	<u>200</u>
Design Head (FT)	<u>16</u>
Horsepower	<u>2.4</u>
Minimum Efficiency(%)	<u>36</u>
Speed (RPM)	<u>1750</u>
Voltage	<u>3/60/460</u>
Discharge Size (IN)	<u>3</u>
Manufacturer	<u>KSB</u>
Pump Model	<u>KRT-F80-200/24UG</u>
Solids Handling Size	<u>3 1/8"</u>

C. ALTERNATE EQUIPMENT

1. Alternate equipment to that specified will be considered for one reason only. The equipment must meet the minimum material construction requirements, have the same or greater warranty provisions, and meet the

Village Crossroads-1  
Scherville IN

requirements for redundancy in the equipment design. Alternate equipment must be quoted with the pump efficiency listed on the bid form with the power cost calculation filled out for the proposed substitution. The owner will evaluate the alternate equipment based on all design factors and the present worth of the power equation. The owner reserves the right to accept or reject any proposed alternate. All bidders are cautioned that their bid price must be based on the use of the specified equipment. No additional money will be spent by the Owner to receive the specified equipment.

2. Pumps which do not meet the specified minimum efficiency with their published pump curves shall be evaluated based on the "present worth" (PW) of operating the pump. The present worth power cost for the pumping equipment shall be determined based on an 8 hour per day pumping time for a life of 20 years, 90 % assumed motor efficiency, and a power cost of \$0.06/ KWHr. The calculation used for the bid form shall be the following:

$$\text{Annual Power Cost (APC)} = \text{BHP} \times \text{KW/BHP} \times \text{Hrs Operation/Day} \times \text{Power Rate}$$

$$\text{Annual Power Cost} = \frac{\text{Head (FT)} \times \text{Flow (GPM)} \times 0.746 \times 8 \text{ Hrs/Day} \times 365 \text{ Days/Year} \times \$0.06/\text{KWHr}}{3960 \times [1 - (\text{specified efficiency} - \text{substitute pump efficiency})] \times 0.90 \text{ (motor eff.)}}$$

$$\text{Annual Power Cost} = \frac{H \times Q \times 0.03667}{[1 - (\text{eff. KSB} - \text{eff. Alt. pump})]}$$

$$\text{Present Worth (20 year)} = \text{APC} \times 10.59 \quad \left( \text{Based on EPA formula of } \text{PW} = \frac{\text{APC} \times [1 - (1+r)^{-n}]}{r} \right)$$

(where r = interest rate (7.0%) and n = 20 years)

## 2.00 PUMP CONSTRUCTION:

- A. Each pump shall be designed as a completely submersible wastewater pump capable of pumping raw unscreened domestic sewage consisting of water, fibrous material, heavy sludge and spherical solids. Pump case, motor housing, impeller, intermediate housing, and backplate shall be constructed from minimum ASTM A-48, Class 35B cast iron. The exterior of the pump/motor assembly shall be sandblasted and coated with a primer coat of iron oxide to a minimum of 35 micrometers. The surfaces shall be finish coated with a double top coat of chlorinated rubber to a thickness of 70 micrometers. Standard epoxy coating will not be considered acceptable.
- B. All fasteners, nuts, bolts, and miscellaneous hardware in contact with the pumped material shall be ASTM A276 type 316Ti stainless steel. O-ring seals shall be Nitrile rubber (NBR).
- C. The pump and motor shaft shall be constructed from carbon steel equal to ASTM A576 (Gr.1045). The shaft shall be provided with a stainless steel shaft sleeve constructed of ASTM A276 type 316Ti.

Village Crossroads-2  
Schererville IN

- D. The pump impeller shall be a statically and dynamically balanced, vortex operating in a concentric pump case. The impeller design shall allow passage of a minimum 3" diameter solid.
- E. The pump shall be provided with replaceable case and impeller wear rings. The case ring shall have a minimum Brinell hardness of 200. The impeller wear ring shall be minimum 300 Brinell hardness. Wear rings shall be designed to maintain pump efficiency and must comply with the above hardness parameters.
- F. The motor shall be sealed by use of a double mechanical seal arrangement consisting of independent upper and lower seals. The upper seal shall be mounted in an oil-filled chamber with drain and inspection plug. The upper seal shall be designed for easy access from external to the pump. The lower mechanical seal shall be installed in tandem to the upper and supplied with an independent spring. Single spring seals will not be considered acceptable.
1. The upper seal shall consist of a hard metal stationary element and rotating carbon element.
  2. The lower seal shall consist of silicon (or tungsten) carbide stationary and rotating elements.
- G. Provide a sensor in the motor's stator cavity to sense moisture. The sensor shall be wired to the control panel to signal an alarm for the condition.

#### 2.01 MOTOR CONSTRUCTION:

- A. The pump motor shall be of the squirrel cage, induction design housed in a completely watertight and air filled chamber. The motor shall be FM listed and explosion proof rated for Class 1, Division 1, Groups C & D as defined by the National Electric Code. The motors shall have a minimum service factor of 1.10. The motor insulation shall be Class F rated for 311 degrees F. The motor shall be designed with sufficient surface area to require only ambient cooling. The motor must be capable of extended operation above the water level without shutdown or failure due to motor temperature rise.
- B. The motor bearings shall have a minimum B-10 bearing life rating of 40,000 hours.
- C. Any oil provided for the motor must be ecologically safe paraffin oil, or equal. No dielectric oils are allowed for any part of the pump.
- D. The motor/pump shaft shall be designed to transmit full driver output with a maximum deflection of 0.002 inches measured at the lower mechanical seal.

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Schererville IN

- E. The motor temperature shall be monitored by thermistors or bimettalics in the motor windings. The control system shall alarm and shut down the pump upon detection of a high temperature condition.
- F. The motor shall be provided with 50 feet of power cord and sensor cable. The provided cable shall be suitable for submersible applications per NEC requirements. One of the following cable entry systems must be provided.
  - 1. Provide a cable terminal box on the side of the motor housing, with cable entry sealed to insure no entry of moisture is possible into the high voltage motor terminal area even if the cable is damaged or severed below the water line.
  - 2. Provide a compressed grommet seal on the cable's outer jacket only, with a sealed terminal board between the cable entry and the motor housing. This sealed terminal board shall serve as a secondary seal against leakage through a damaged cable jacket. Provide a moisture detector in the sealed junction chamber area to signal and shut down the pump motor before shorting and motor damage can occur.

**3.00 SLIDE COUPLING SYSTEM:**

- A. The pump connection system shall consist of an upper guide bracket, 316 stainless steel guide cable and a discharge base elbow. The guide system shall provide positive connection to the base elbow.
- B. The connection system shall be designed so the contractor can be within 5 degrees of plumb in any direction and still provide positive mating of the pump to the base elbow, regardless of depth of the basin.
- C. The discharge elbow shall be designed for a leak free connection. The manufacturer shall perform a pump down test on each pump at the time of start up to insure no leakage around the faces of the mating sealing surfaces. If leakage exists, the manufacturer shall enter the wet well and correct the condition so no leakage is present. The test shall be repeated until the owner and engineer are satisfied that no leakage is occurring. **THIS CONNECTION GUARANTEE IS TO BE SUPPLIED BY THE MANUFACTURER.**
- D. A 316 stainless steel lifting chain shall be supplied for each pump by the pump manufacturer. The chain shall be designed to lift the pump with a service factor of 2.0 or with 500 LBS excess load capacity (whichever is greater.) The chain length shall be equal to the wet well depth plus 6 feet.

- E. The pump manufacturer shall unconditionally guarantee the guide cable (or rail) connection system and all its parts for a period of ten years. The manufacturer shall provide a written guarantee with equipment submittals.

**3.50 CONTROLS:**

- A. Controls shall be supplied as part of the generator system and shall be housed in the same.

**4.00 MANUFACTURED EQUIPMENT:**

- A. These specifications are based on the certain products deemed most suitable for the application involved. The following manufacturers equipment has been used for the basis of the above specifications.

Pumps and slide couplings: KSB  
Contact: Trey Hardesty (708) 891-4400

- B. All equipment specified above shall be supplied by a single supplier with a single source service and warranty facility. Other systems will only be considered if the supplier presubmits to the owner and engineer full design drawings a minimum of two weeks prior to the bid date. Any acceptable alternates will be identified by addendum. If the contractor wishes to use the alternate equipment the difference in price shall be deducted from the bid price. Pricing shall be verified by providing the owner certified copies of both suppliers' proposals. No equipment shall be ordered without prior approval from the engineer.

- C. A minimum of 6 complete equipment submittals shall be provided for review and approval.

**5.00 START UP SERVICES**

- A. The system supplier shall include the cost of a field inspection trip and a start up trip of one day each. The manufacturer shall advise in writing of any irregularities which will void warranty.

**6.00 WARRANTY:**

- A. The pump manufacturer shall warrant the pump for a period of five years on a graduated scale as defined in the manufacturers warranty statement. The warranty shall be graduated in straight line from 100 % coverage in the first year to 14% in the fifth year.
- B. The pump manufacturer shall warrant the guide connection system for a period of ten years as spelled out in Section 3.00 E of these specifications.

Village Crossroads-5  
Scherville IN



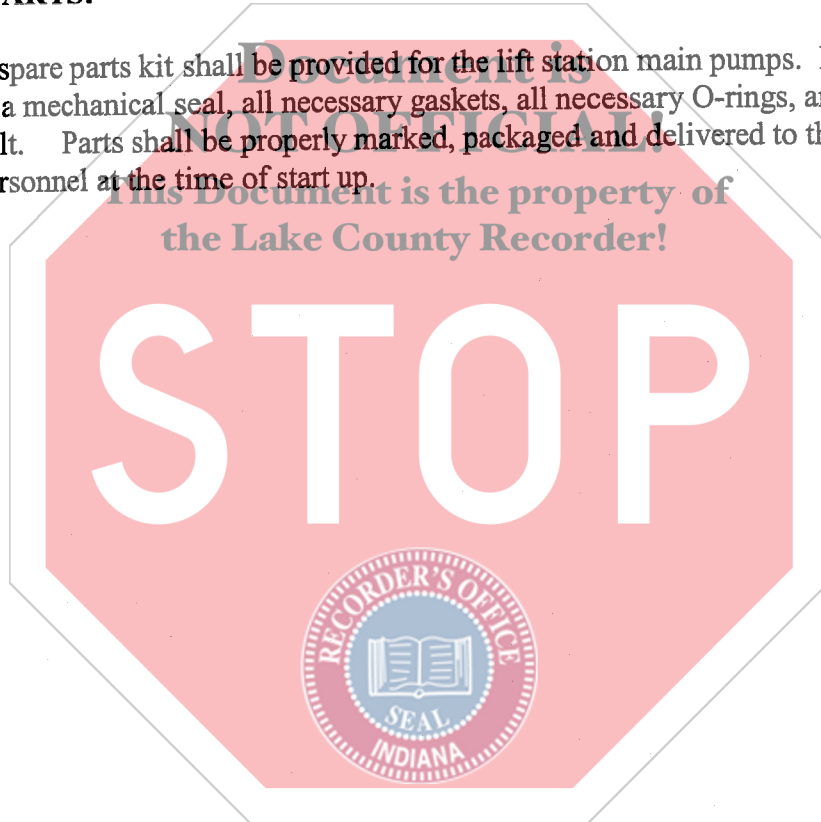
- C. The control equipment and all other supplied items shall be warranted for a period of one year per manufacturer's standard warranty.

**7.00 EQUIPMENT SUPPLIER:**

- A. The equipment shall be supplied by a local representative of the manufacturer. The local representative must offer in house service capabilities as a normal scope of his business. As a minimum the representative must have at his local facility a complete equipment service shop area arranged and equipped to provide in house factory authorized service for any equipment supplied. The representative must offer 24 hour emergency field service capabilities year round by factory trained and authorized technicians.
- B. Equipment sales offices who do not offer the aforementioned services as a normal part of their business scope will not be considered as acceptable equipment suppliers for this project.

**8.00 SPARE PARTS:**

- A. A spare parts kit shall be provided for the lift station main pumps. It shall consist of a mechanical seal, all necessary gaskets, all necessary O-rings, and an impeller bolt. Parts shall be properly marked, packaged and delivered to the maintenance personnel at the time of start up.





Precision Systems ■ 1530 Huntington Drive ■ Calumet City, IL 60409  
P: 708-891-4300 ■ F: 708-891-4401 ■ www.precision-systems.com

JOB NAME: Village Crossroad Storm water Station

DATE: 7/25/2006

1.00 TIP-UP POWER-PAC

1.01 GENERAL

A. The contractor shall furnish and install, as shown on the plans, one (1) pre-fabricated, skid mounted, weatherproof, standby power system. The standby power system shall monitor incoming electrical utility and shall provide its own standby power to the related equipment in the event of power loss, phase loss, etc. The standby power system and appurtenances shall be maintained in an enclosed fiberglass structure designed to provide resistance to rusting, operational reliability through environmental control, and provide ease of access to housed components. It is the supplier's responsibility to include all necessary appurtenances to provide for a complete, automatic, and smooth operating system.

B. The principal items of equipment shall include, but not be limited to, the following:

1. Engine generator set
2. Engine control
3. Generator control
4. Automatic transfer switch
5. One-piece seamless fiberglass enclosure
6. Fabricated steel base structure
7. Intake and exhaust louvers and ductwork
8. Environmental accessories

1.02 BASIS OF CONTRACTORS BID

A. The standby power system shall be of the type manufactured by Precision Systems, Calumet City, IL. The equipment specified has been deemed most suitable for the application. The contractor is required to base their submitted bid on the specified equipment. No equal alternate suppliers are known for this equipment. A not to exceed budget price has been furnished by the supplier to protect the owner.

B. The determination of the specified equipment is based upon review of system components and presently operating systems. The design is based on equipment which has been in operation for 20 years where the generator and automatic transfer switch show no signs of rusting, deterioration, or have required major service. Alternate systems which can exhibit similar service on outdoor installations showing 20 years of continuous service without deterioration may be considered after the bid. Where alternate systems are to be submitted for consideration the contractor shall furnish the specified manufacturers proposal and the alternate suppliers proposal. Any difference in price shall be offered as a change order reduction to the contract bid price. Alternate systems will not be considered without a full credit to the owner.

- C. If an alternate is to be proposed, the contractor shall furnish a complete change order proposal to the owner within ten days of the contract award. The proposal must include the following data for evaluation.
1. A complete specification for the proposed standby power system.
  2. A statement of full conformance to the bid specification signed by an officer of the manufacturer. All deviations must be clearly identified in the statement of conformance.
  3. A general arrangement drawing showing overall dimensions, equipment layout and service couplings.
  4. Complete submittal data for all major components ( standby power generator, automatic transfer switch, fiberglass housing, steel base structure, louvers, and environmental components, etc).
  5. An electrical schematic showing power wiring.
  6. Installation list of 20 locations including contact names and phone numbers of customers having in service the proposed design **with fiberglass enclosure** for a minimum of 5 years. List shall include five references with at least 20 years of continuous service to verify equipment longevity and reliability.
- D. It is the sole discretion of the owner/engineer to determine if the data submitted shows the standby power system to be equal to the system specified. The contractor shall pay the owner and engineer for any and all review costs for review of any alternate which is not accepted as an equal to the specified system.

2.00 ENGINE GENERATOR SET

2.01 OPERATING CONDITIONS

- A. Engine generator set shall be capable of continuous standby rating at 0.8PF at the conditions and minimum capabilities listed in Table 1. The unit shall be capable of the KW and KVA for motor starting at a maximum sustained voltage dip of 10% listed in Table 1.

2.02 ENGINE GENERATOR AND ENGINE EQUIPMENT

A. Performance

1. Generator shall meet or exceed the performance and design characteristics outlined in Table 2.
2. Voltage regulation shall be plus or minus 0.5 percent for any constant load between no load and rated load. Random voltage variation with any steady load from no load to full load shall not exceed plus or minus 0.5 percent.
3. Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.25%.
4. The engine-generator set shall pick up a single step load of 100% nameplate KW and power factor, less applicable derating factors, with the engine-generator set at operating temperature.
5. Motor starting capability shall be within the minimums listed in Table 2. The generator set shall be capable of recovering to a minimum of 90% of rated no load voltage following the application of the specified KVA load at near zero power factor applied to the generator set.
6. The AC generator shall produce a clean AC voltage waveform, with not more than 5% total harmonic distortion at full linear load, when measured from line to neutral, and with not more than 3% in any single harmonic, and no 3rd order harmonics or their multiples. Telephone influence factor shall be less than 40.

B. Construction

1. The engine generator set shall be mounted on a heavy-duty steel base to maintain alignment between components. The base shall incorporate a battery tray with hold-down clamps within

the rails.

2. All switches, lamps, and meters in the control system shall be oil-tight and dust-tight. All active control components shall be installed within a UL/NEMA 3R enclosure. There shall be no exposed points in the control (with the door open) that operate in excess of 50 volts.
3. The engine shall be a 4-cycle, inner cooled, turbocharged or naturally aspirated, as required by engine manufacturer. Engine shall be certified as capable of developing the minimum horsepower output rating listed in Table 2 at 1800 RPM.
4. Minimum fuel rating and fuel consumption at full load shall be as listed in Table 2.
5. Engine equipment shall include the following:
  - a. Electric starter as required by the manufacturer.
  - b. Fuel filter with replaceable element.
  - c. Replaceable dry element air cleaner.
  - d. Positive displacement mechanical full pressure, lubrication oil pump with full flow lubrication oil filters.
  - e. Engine speed shall be governed by governor system specified in Table 2 which will automatically control frequency to a maximum rating less than that specified in Table 2 from full load to no load.
6. Engine protective devices to indicate alarm and engine shutdown for the following:
  - a. Low coolant temperature alarm.
  - b. Low coolant level shutdown.
  - c. Low lubrication oil pressure alarm and shutdown.
  - d. High coolant temperature alarm and shutdown.
  - e. Over speed shutdown.
  - f. Over crank lockout.
7. Engine mounted thermostatically controlled water jacket heaters shall be rated for 120 volts, single phase, 60 hertz at the wattage shown in Table 2.
8. Battery charging alternator with solid state regulator.
9. Engine shall be cooled by engine mounted radiator system including belt driven pusher fan, coolant pump, and thermostat temperature control. The radiator shall be provided with a duct adaptor flange.
10. The engine exhaust muffler shall be of a spiral type and shall be rated for residential silencing. The muffler shall be mounted so that its weight is not supported by the engine and shall utilize flexible stainless steel exhaust connectors. The exhaust piping shall be routed through the side wall of the steel base and be terminated outside the enclosure. Piping outside the enclosure shall be insulated with a minimum 2" thick calcium silicate thermal insulation with aluminum shroud.
11. Provide connections for connecting fuel system to the engine in compliance with applicable codes and regulations.

## 2.03 AC GENERATOR

- A. The AC generator shall be; synchronous, four pole, 2/3 pitch, revolving field, drip-proof construction, single pre-lubricated sealed bearing, air cooled by a direct drive centrifugal blower fan, and directly connected to the engine with flexible drive disc. All insulation system components shall meet NEMA MG1 temperature limits for insulation system noted in Table 2. Actual temperature rise measured by resistance method at full load shall not exceed temperature listed in Table 2.
- B. The generator shall be capable of delivering rated output KVA at rated frequency and power factor, at any voltage not more than 5 percent above or below rated voltage.
- C. A permanent magnet generator (PMG) shall be included to provide a reliable source of excitation

power for optimum motor starting and short circuit performance. The PMG and controls shall be capable of sustaining and regulating current supplied to a single phase or three phase fault at approximately 300% of rated current for not more than 10 seconds.

## 2.04 GENERATOR SET MICROPROCESSOR CONTROL

### A. Control Switches

1. Mode Select Switch. The mode select switch shall initiate the following control modes. When in the RUN or Manual position the generator set shall start, and accelerate to rated speed and voltage as directed by the operator. In the OFF position the generator set shall immediately stop, bypassing all time delays. In the AUTO position the generator set shall be ready to accept a signal from a remote device to start and accelerate to rated speed and voltage.
2. EMERGENCY STOP switch. Switch shall be Red "mushroom-head" push-button. Depressing the emergency stop switch shall cause the generator set to immediately shut down, and be locked out from automatic restarting.
3. RESET switch. The RESET switch shall be used to clear a fault and allow restarting the generator set after it has shut down for any fault condition.
4. PANEL LAMP switch. Depressing the panel lamp switch shall cause the entire panel to be lighted with DC control power. The panel lamps shall automatically be switched off 10 minutes after the switch is depressed, or after the switch is depressed a second time.

### B. Generator Set Alarm and Status Display

1. The generator set control shall include LED alarm and status indication lamps. The lamps shall be high-intensity LED type. The lamp condition shall be clearly apparent under bright room lighting conditions. Functions indicated by the lamps shall include:
  2. The control shall include five configurable alarm-indicating lamps. The lamps shall be field adjustable for function, color, and control action (status, warning, or shutdown). The control shall include green lamps to indicate that the generator set is running at rated frequency and voltage, and that a remote start signal has been received at the generator set. The running signal shall be based on actual sensed voltage and frequency on the output terminals of the generator set.
  3. The control shall include a flashing red lamp to indicate that the control is not in automatic state, and red common shutdown lamp. The control shall include an amber common warning indication lamp.
  4. The generator set control shall indicate the existence of the following alarm and shutdown conditions on an alphanumeric digital display panel:
    - a. low oil pressure (alarm)
    - b. low oil pressure (shutdown)
    - c. oil pressure sender failure (alarm)
    - d. low coolant temperature (alarm)
    - e. high coolant temperature (alarm)
    - f. high coolant temperature (shutdown)
    - g. high oil temperature (warning)
    - h. engine temperature sender failure (alarm)
    - i. low coolant level (alarm or shutdown--selectable)
    - j. fail to crank (shutdown)
    - k. fail to start/over crank (shutdown)
    - l. over speed (shutdown)
    - m. low DC voltage (alarm)
    - n. high DC voltage (alarm)
    - o. weak battery (alarm)
    - p. low fuel-daytank (alarm)

- q. high AC voltage (shutdown)
  - r. low AC voltage (shutdown)
  - s. under frequency (shutdown)
  - t. over current (warning)
  - u. over current (shutdown)
  - v. short circuit (shutdown)
  - w. over load (alarm)
  - x. emergency stop (shutdown)
5. Provisions shall be made for indication of four customer-specified alarm or shutdown conditions. Labeling of the customer-specified alarm or shutdown conditions shall be of the same type and quality as the above-specified conditions. The non-automatic indicating lamp shall be red, and shall flash to indicate that the generator set is not able to automatically respond to a command to start from a remote location.
6. The control shutdown fault conditions shall be configurable for fault bypass.

**C. Engine Status Monitoring**

1. The following information shall be available from a digital status panel on the generator set control :
- a. engine oil pressure (psi or KPA)
  - b. engine coolant temperature (degrees F or C)
  - c. engine oil temperature (degrees F or C)
  - d. engine speed (rpm)
  - e. number of hours of operation (hours)
  - f. number of start attempts
  - g. battery voltage (DC volts)
2. The control system shall also incorporate a data logging and display provision to allow logging of the last 10 warning or shutdown indications on the generator set, as well as total time of operation at various loads, as a percent of the standby rating of the generator set.

**D. Engine Control Functions**

- 1. The control system provided shall include a cycle cranking system,
- 2. The control system shall include an idle mode control, which allows the engine to run in idle mode in the RUN position only.
- 3. The control system shall include an engine governor control, which functions to provide steady state frequency regulation as noted elsewhere in this specification. The governor control shall include adjustments for gain, damping, and a ramping function to control engine speed and limit exhaust smoke while the unit is starting.
- 4. The control system shall include time delay start (adjustable 0-300 seconds) and time delay stop (adjustable 0-600 seconds) functions.
- 5. The control system shall include sender failure monitoring logic for speed sensing, oil pressure, and engine temperature which is capable of discriminating between failed sender or wiring components, and an actual failure conditions.

**E. Alternator Control Functions**

- 1. The generator set shall include an automatic digital voltage regulation system that is matched and prototype tested by the engine manufacturer with the governing system provided.
- 2. Controls shall be provided to monitor the output current of the generator set and initiate an alarm (over current warning) when load current exceeds 110% of the rated current of the generator set on any phase for more than 60 seconds. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (over current shutdown). The protective functions provided shall be in compliance

to the requirements of NFPA70 article 445.

3. Controls shall be provided to individually monitor all three phases of the output current for short circuit conditions. The control/protection system shall monitor the current level and voltage. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (short circuit shutdown). The protective functions provided shall be in compliance to the requirements of NFPA70 article 445.
4. Controls shall be provided to monitor the KW load on the generator set, and initiate an alarm condition (over load) when total load on the generator set exceeds the generator set rating for in excess of 5 seconds. Controls shall include a load shed control, to operate a set of dry contacts (for use in shedding customer load devices) when the generator set is overloaded.
5. An AC over/under voltage monitoring system that responds only to true RMS voltage conditions shall be provided. The system shall initiate shutdown of the generator set when alternator output voltage exceeds 110% of the operator-set voltage level for more than 10 seconds, or with no intentional delay when voltage exceeds 130%. Under voltage shutdown shall occur when the output voltage of the alternator is less than 85% for more than 10 seconds.

**F. Other Control Functions**

1. A battery monitoring system shall be provided which initiates alarms when the DC control and starting voltage is less than 25VDC or more than 32 VDC. During engine cranking (starter engaged), the low voltage limit shall be disabled, and DC voltage shall be monitored as load is applied to the battery, to detect impending battery failure or deteriorated battery condition.

**G. Control Interfaces for Remote Monitoring**

1. The control system shall provide four programmable output relays. These relay outputs shall be configurable for any alarm, shutdown, or status condition monitored by the control. The relays shall be configured to indicate: (1) generator set operating at rated voltage and frequency, (2) common warning, (3) common shutdown, (4) load shed command.
2. A fused 10 amp switched battery voltage power supply circuit shall be provided for customer use. DC power shall be available from this circuit whenever the generator set is running.
3. A fused 10 amp battery voltage power supply circuit shall be provided for customer use. DC power shall be available from this circuit at all times from the engine starting/control batteries.
4. The control shall be provided with a direct serial communication link for the LonWorks communication network interface as described elsewhere in this specification and shown on the drawings.

**2.05 OTHER EQUIPMENT TO BE PROVIDED WITH GENERATOR SET**

- A. The generator set shall be provided with a mounted main line circuit breaker, sized to carry the rated output current of the generator set.

**2.06 GENERATOR MODEL**

- A. The standby generator shall be equal or superior to the manufacturer and model specified in Table 2.

**3.00 AUTOMATIC TRANSFER SWITCH**

**3.01 GENERAL**

- A. The complete microprocessor controlled automatic transfer switch shall be designed and manufactured by the manufacturer of the engine generator set. It shall be UL 1008 listed and be approved by the Canadian Standards Association. The manufacturer shall furnish schematic and wiring diagrams for the automatic transfer switch and a typical interconnection wiring diagram for the entire standby system. Test reports certified by the manufacturer shall be provided to the

engineer for the entire engine/generator/transfer switch system.

### 3.02 RATINGS

- A. The transfer switch shall be rated 125 amps and 600 Volts AC minimum. The transfer switch shall be rated to carry 100% of rated current continuously in the enclosure supplied, in ambient temperatures of -40 to +60 degrees C, relative humidity up to 90% (non- condensing), and altitudes up to 10,000 feet.

### 3.03 CONSTRUCTION

- A. The transfer switch shall be double-throw, electrically and mechanically interlocked, and mechanically held in the source 1 and source 2 positions. The transfer switch shall be specifically designed to transfer to the best available source if it inadvertently stops in a neutral position.
- B. Transfer switches rated through 1000 amperes shall be equipped with permanently attached manual operating handles and quick-break, quick-make over-center contact mechanisms. Transfer switches over 1000 amperes shall be equipped with manual operators for service use only under de-energized conditions.
- C. Main switch contacts shall be high-pressure silver alloy. Contact assemblies shall have arc chutes for positive arc extinguishing. Arc chutes shall have insulating covers to prevent inter-phase flashover.
- D. Transfer switch internal wiring shall be composed of pre-manufactured harnesses that are permanently marked for source and destination. Harnesses shall be connected to the control system by means of locking disconnect plug(s), to allow the control system to be easily disconnected and serviced without disconnecting power from the transfer switch mechanism.
- E. Transfer switch shall be provided with flame retardant transparent covers to allow viewing of switch contact operation but prevent direct contact with line voltage components.
- F. Transfer switches designated on the drawings as 4-pole shall be provided with a switched neutral pole. The neutral pole shall be of the same construction and have the same ratings as the phase poles. All poles shall be switched simultaneously using a common crossbar. Equipment using add-on accessory overlapping contacts are not acceptable.
- G. Transfer switches that are designated on the drawings as 3-pole shall be provided with a neutral bus and lugs. The neutral bus shall be sized to carry 100% of the current designated on the switch rating.

### 3.04 CONNECTIONS

- A. Field control connections shall be made on a common terminal block that is clearly and permanently labeled.
- B. Transfer switch shall be provided with AL/CU mechanical lugs sized to accept the full output rating of the generator set.

### 3.05 OPERATOR CONTROLS

- A. Each transfer switch shall be provided with a control panel to allow the operator to view the status and control operation of the transfer switch. The operator panel shall be a sealed membrane panel rated NEMA 3R/IP53 or better (regardless of the enclosure rating) that is permanently labeled for switch and control functions. The operator panel shall be provided with the following features and capabilities:
  - 1. High intensity LED lamps to indicate the source that the load is connected to (source 1 or source 2), and which source(s) are available. Source available LED indicators shall operate from the control microprocessor to indicate the true condition of the sources as sensed by the control.
  - 2. High intensity LED lamps to indicate that the transfer switch is "not in auto" (due to control



being disabled or due to bypass switch enabled or in operation) and "Test/Exercise Active" to indicate that the control system is testing or exercising the generator set.

3. "OVERRIDE" pushbutton to cause the transfer switch to bypass any active time delays for start, transfer, and re-transfer and immediately proceed with its next logical operation.
4. "TEST" pushbutton to initiate a preprogrammed test sequence for the generator set and transfer switch. The transfer switch shall be programmable for test with load or test without load.
5. "RESET/LAMP TEST" pushbutton that will clear any faults present in the control, or simultaneously test all lamps on the panel by lighting them.
6. The control system shall continuously log information on the number of hours each source has been connected to the load, the number of times transferred, and the total number of times each source has failed. This information shall be available via the service tool or an operator display panel.

### 3.06 INTERNAL CONTROLS

- A. The transfer switch internal control system shall be configurable in the field for any operating voltage level up to 600VAC. Provide RMS voltage sensing and metering that is accurate to within plus or minus 1% of nominal voltage level. Frequency sensing shall be monitored based on the normal voltage at the site. Systems that utilize voltage monitoring based on standard voltage conditions are not acceptable.
- B. Transfer switch voltage sensors shall be close differential type, providing source availability information to the control system based on the following functions:
  1. Monitoring all phases of the normal service (source 1) for under voltage conditions (adjustable for pickup in a range of 85 to 98% of the normal voltage level and dropout in a range of 75 to 98% of normal voltage level).
  2. Monitoring all phases of the emergency service (source 2) for under voltage conditions (adjustable for pickup in a range of 85 to 98% of the normal voltage level and dropout in a range of 75 to 98% of pickup voltage level).
- C. All transfer switch sensing shall be configurable from a windows 95 or NT PC-based service tool, to allow setting of levels, and enabling or disabling of features and functions. Selected functions including voltage sensing levels and time delays shall be configurable using the operator panel. Designs utilizing DIP switches or other electromechanical devices are not acceptable. The transfer control shall incorporate a series of diagnostic LED lamps.
- D. The transfer switch shall be configurable to control the operation time from source to source (program transition operation). The control system shall be capable of enabling or disabling this feature, and adjusting the time period to a specific value. A phase band monitor or similar device is not an acceptable alternate for this feature.
- E. The transfer switch shall incorporate adjustable time delays for generator start (adjustable in a range from 0-15 seconds); transfer (adjustable in a range from 0-120 seconds); retransfer (adjustable in a range from 0-30 minutes); and generator stop (cooldown)(adjustable in a range from 0-30 minutes).
- F. The control system shall be designed and prototype tested for operation in ambient temperatures from -40C to +70C. It shall be designed and tested to comply with the requirements of the following voltage and RFI/EMI standards.
- G. The control shall have optically isolated logic inputs, high isolation transformers for AC inputs, and relays on all outputs, to provide optimum protection from line voltage surges, RFI and EMI.
- H. The transfer switch shall be provided with a battery charger for the generator set starting batteries. The battery charger shall be a float type charger rated 2 amps. The battery charger shall include an ammeter for display of charging current and shall have fused AC inputs and DC

outputs.

### 3.07 CONTROL INTERFACE

- A. The transfer switch will provide an isolated relay contact for starting of a generator set. The relay shall be normally held open, and close to start the generator set. Output contacts shall be form C, for compatibility with any generator set.
- B. Provide one set of form C auxiliary contacts on both sides, operated by transfer switch position, rated 10 amps 250VAC.
- C. The transfer switch shall provide relay contacts to indicate the following conditions: source 1 available, load connected to source 1, source 2 available, load connected to source 2.

### 3.08 ENCLOSURE

- A. Enclosures shall be UL listed. The enclosure shall provide NEC wire bend space. The cabinet door shall be key-locking.
- B. Transfer switches shall be mounted in an enclosure of the types as designated on the drawings. Separate enclosures shall be the NEMA type specified. The cabinet shall provide code-required wire bend space at point of entry as shown on the drawings. Manual operating handles and all control switches (other than key-operated switches) shall be accessible to authorized personnel only by opening the key-locking cabinet door. Transfer switches with manual operating handles and/or non key-operated control switches located on outside of cabinet do not meet this specification and are not acceptable.

### 3.09 OPEN TRANSITION OPERATION

- A. Transfer switch normally connects an energized utility power source (source 1) to loads and a generator set (source 2) to the loads when normal source fails. The normal position of the transfer switch is source 1 (connected to the utility), and no start signal is supplied to the genset.
- B. Generator Set Exercise (Test) With Load Mode. The control system shall be configurable to test the generator set under load. In this mode, the transfer switch shall control the generator set in the following sequence:
  - 1. Transfer switch shall initiate the exercise sequence at a time indicated in the exercise timer program, or when manually initiated by the operator.
  - 2. The transfer switch shall issue a compatible start command to the generator set.
  - 3. When the control system senses the generator set at rated voltage and frequency, it shall operate to connect the loads to the generator set by opening the normal source contacts, and closing the alternate source contacts a predetermined time period later. The timing sequence for the contact operation shall be programmable in the controller.
  - 4. The generator set shall operate connected to the load for the duration of the exercise period. If the generator set fails during this period, the transfer switch shall automatically reconnect the loads to the normal service.
  - 5. On completion of the exercise period, the transfer switch shall operate to connect the loads to the normal source by opening the alternate source contacts, and closing the normal source contacts a predetermined time period later. The timing sequence for the contact operation shall be programmable in the controller.
  - 6. The transfer switch shall operate the generator set unloaded for a cool down period, and then remove the start signal from the generator set. If the normal power fails at any time when the generator set is running, the transfer switch shall immediately connect the system loads to the generator set.
- C. Generator Set Exercise (Test) Without Load Mode. The control system shall be configurable to test the generator set without transfer switch load connected. In this mode, the transfer switch shall control the generator set in the following sequence:

1. Transfer switch shall initiate the exercise sequence at a time indicated in the exercise timer program, or when manually initiated by the operator.
2. The transfer switch shall issue a compatible start command to the generator set.
3. When the control system senses the generator set at rated voltage and frequency, it shall operate the generator set unloaded for the duration of the exercise period.
4. At the completion of the exercise period, the transfer switch shall remove the start signal from the generator set. If the normal power fails at any time when the generator set is running, the transfer switch shall immediately connect the system loads to the generator set.

### 3.10 OTHER REQUIREMENTS

- A. The transfer switch supplier shall perform a complete operational test on the transfer switch prior to shipping from the factory. A certified test report shall be available on request. Test process shall include calibration of voltage sensors.
- B. The manufacturer of the transfer switch shall maintain service parts inventory at a central location which is accessible to the service location 24 hours per day, 365 days per year.
- C. The transfer switch shall be serviced by a local service organization that is trained and factory certified in both generator set and transfer switch service. The supplier shall maintain an inventory of critical replacement parts at the local service organization, and in service vehicles. The service organization shall be on call 24 hours per day, 365 days per year.
- D. The manufacturer shall maintain model and serial number records of each transfer switch provided for at least 20 years.
- E. The transfer switch shall be equal or superior to Model OTPC125 as manufactured by Cummins-Onan.

### 4.00 GENERATOR MONITORING SYSTEM

- A. The manufacturer shall provide a continuous twenty four (24) hour alarm monitoring system to monitor the status of the generator for twenty four (24) months after start up or twenty seven (27) months after shipment, whichever occurs first. The system shall relay information to the manufacturer's web site, where it can be exclusively accessed by the user and/or the manufacturer. The system shall also have the capability of instantaneous alarm notification through telephone calling, e-mails, pages, or any combination of those items.
- B. The system shall not require phone or radio hookup and shall not require a communication charge. All transmission of data shall be through a self contained monitoring system located within the control enclosure. The system shall be pre-wired at the manufacturer to all monitored equipment and shall be tested prior to shipment. Monitoring systems installed at start-up and/or not factory tested shall not be considered equal or approved.
- C. The system shall monitor the following conditions as a minimum:
  1. Cumulative generator run time hours
  2. Generator fail alarm
  3. Utility power fail alarm
- D. The end user shall select the reporting method desired at time of start-up, i.e. phone, e-mail, page, or no notification.
  1. If no direct notification is desired, the manufacturer shall monitor the station for the designated time period, at no additional cost. The manufacturer shall notify the end user of any alarm conditions transmitted by the monitoring system via phone or FAX. The manufacturer shall bear no responsibility for any/all consequential damages resulting from a failure to make contact with the end-user.
- E. The system shall be the Sta-Calm system manufactured by Precision Systems or engineer approved equal.

5.00 PUMP CONTROL SYSTEM

5.01 GENERAL REQUIREMENTS

- A. The control equipment shall be a Precision Systems Triplex control system with a NEMA Type 12 metallic enclosure. The pump controller, control switches, pilot lights and elapsed time meters shall be mounted on the enclosure observable and operable without accessing the high voltage interior of the enclosure.
- B. Thermal magnetic circuit breakers shall be provided for branch disconnect service and short circuit protection of all motor control and auxiliary circuits for the environmental systems within the station. Circuit breakers shall be operable without accessing the high voltage interior of the enclosure. A minimum of one (1) spare circuit breaker shall be provided.
- C. NEMA rated magnetic across-the-line starters with under-voltage release and overload coils for each phase shall be provided for each pump motor to give positive protection. Each single phase auxiliary motor shall be equipped with an over-current protection device in addition to the branch circuit breaker or shall be impedance protected. All switches shall be labeled and a coded wiring diagram shall be provided.
- D. Non-resettable six digit elapsed time meters shall be provided for each pump to monitor the cumulative operating time of the pump.
- E. Moisture detection relays will be provided for both pumps. Motor temperature leads shall be connected such as to remove the pump from service if over temperature of the motor is indicated.
- F. Pilot lights shall be provided to indicate:
1. High/Low wet well level "Red" (integral to controller)
  2. Pump running (3) "Green"
  3. Pump seal failure (3) "Amber"
  4. Motor high temperature (3) "Red"
- G. Pump starting shall be done via time delay to prevent overload due to simultaneous pump starting. The delay shall be adjustable and shall be set to prevent the pumps from starting less than five seconds apart.
- H. The control system shall be supplied with a lightning and surge arrester wired into each of the three legs of the three phase service.
- I. A red alarm strobe shall be provided mounted on the exterior of the enclosure for indication of the following alarm conditions:
- J. Dry contacts shall be provided for the following alarm criteria:
1. High/low wet well
  2. Station flood
  3. Utility power fail
  4. Generator fail
- K. Ten (10) spare terminal blocks shall be provided in the pump control panel for connection of external alarm criteria into pump panel to provide a central interface point.
- L. All switches shall be labeled and a coded wiring diagram shall be provided.

5.02 CONTROLLER

- A. The pump controller shall be a standard, catalogued product of a wastewater pumping automation equipment manufacturer regularly engaged in the design and manufacture of such equipment. The pump controller shall be specifically designed for wastewater pumping automation utilizing built-in preconfigured control and telemetry strategies allowing control of 1 to 3 pumps. "One of a kind" systems using custom software with a generic programmable controller will not be acceptable.

- B. The operating program shall be resident in non-volatile FLASH memory and include full-scale ranging and pump-down determination. The controller shall be arranged to operate up to three (3) pumps plus high and low (analog) alarms. The ON and OFF adjustments of each pump and alarm setpoint shall be full-range adjustable through use of an authorized operator access code and a keypad. The controller display shall show the operation of each control stage.
- C. The controller shall include keypad adjustable on-delay timing logic to provide staggered pump starting following a power failure condition. Keypad adjustable off delay timing for each pump control stage shall provide smooth transition between control stages.
- D. The pump controller shall operate on 120 AC power. A power on LED shall be built on board providing local indication that power is available to the unit.
- E. The pump controller shall be furnished with a user friendly operator interface allowing adjustment and viewing of all system parameters and status. The operator interface shall be NEMA 4 rated suitable for front door mounting including locations requiring wash-down and moisture protection.
- F. The process variable signal, Pump 1, 2, & 3 On/Off and High/Low Setpoints, shall be displayed simultaneously via front panel mounted long lasting Ultra Bright LED bar graphs. These bar graphs shall be vertically mounted in parallel fashion to provide relational viewing of all setpoints vs. the measured process. Each display column shall have a minimum of 40 segments of resolution. Each setpoint column shall have a status LED mounted on top of the associated setpoint providing indication of setpoint activation status. Units that require operator action to view the above parameters are not acceptable.
- G. To assure the highest resolution and accuracy, the process display shall be configured to display the full range of the actual measured process. The display ranges shall be field configurable.
- H. System Pump On/Off and Alarm setpoint parameters shall be easily adjustable via individual up and down pushbutton arrows located next to the associated setpoint display column(s).
- I. The unit shall have a built in process simulation capability allowing the operator to verify system operation by forcing the process variable up or down via pushbutton arrows located next to the process display. To prevent accidentally leaving the unit in simulation mode, the pump controller shall be configured to automatically restore monitored process display within 2 minutes after last keypad usage or immediately upon operator initiated restore.
- J. The display unit shall incorporate a high contrast LCD panel allowing for viewing of higher level functions including the following:
1. Process display to 0-100 of the full scale process range.
  2. Time and Date Stamped Alarms & Events
  3. Pump Statistics (Including Run Time, Number Of Starts, Daily Average Number Of Starts)
  4. System diagnostics
  5. Controller Security
  6. Unauthorized Station Entry Detection
- K. The pump controller shall provide on board 24 VDC loop power output for external loop powered sensor. A built-in Analog Supply Voltage Status LED shall indicate availability of loop power. Unit shall be able to monitor a 4-20 mA input representing the process to be controlled. The analog digital conversion shall not be less than 16 bit to allow accurate measurement of the process variable. The analog input circuitry shall provide optical isolation from the main board to the field device. A minimum of 1000 volts electrical isolation shall be required. The Analog process signal shall be displayed locally via 40 segment vertical LED display and the LCD digital display as specified above. This signal shall also be available for telemetry transmission.
- L. The pump controller shall have the ability to monitor up to 16 digital inputs to be used to provide monitoring of local station status. Each discrete input shall provide optical isolation from the main board to the field device. A minimum of 1500 volts electrical isolation shall be required. An on board LED shall be provided indicating that digital Input isolation is not compromised. All discrete inputs shall be available for telemetry transmission.
- M. The pump controller LCD shall operate in a manual scrolling menu mode with the various

displays shown in sequence as selected by the keypad's up/down arrow keys. The display shall indicate the specific function entered on the keypad to confirm that selection of a particular output or other function from the keypad during adjustment or review routines.

- N. The pump controller shall be protected from unauthorized changes via built-in system security. The unit shall support 3 levels of security in a hierarchical structure allowing different levels of access to the pump controller for differentiation of desired access levels to include Operator, Maintenance, & Supervisory access levels.
- O. The pump controller shall provide outputs for interface to local pumps and alarm annunciation equipment. Relay isolated contact outputs for activation of Pump 1, Pump 2, Pump 3, Common Alarm and Alarm Horn shall be provided. Each contact shall be rated for a minimum of 10 amps at 120 VAC or 5 Amps at 240 VAC. Open collector outputs for Low and High Level Alarm shall be provided for interface to off board monitoring equipment. Open collector outputs shall have a minimum operating range of 5-30 VDC @ 100 mA.
- P. The pump controller provides a 4-20 mA output signal for interface to external equipment including VFD's, Chart Recorders or other monitoring devices. Analog output can be configured to provide output representing process variable for retransmission or as a process control output for interface to VFD's or other process controlled device.
- Q. The pump controller shall support contact closure inputs from float or pressure switches representing high and low level. The pump controller shall annunciate these inputs as alarms and use them to provide back up control in the event the primary (analog) sensor fails. Unit will provide local alarm indication and utilize the inputs to cycle pumps on and off to maintain system operation.
- R. The pump controller shall have built-in standard operator adjustable alternation functions allowing for sequencing and equalizing wear of the pumps. The following alternation sequences shall be supported.
1. Fixed
  2. Rotary
  3. First On First Off (FOFO)
  4. Utilize One Favor Others (UOFO)
  5. Emergency Mode
- S. The pump controller shall include built-in Pump Failure detection logic. In the event the pump has been called into operation and the pump run signal is not received within a pre-adjustable time period. A motor failure shall be produced. The failed motor shall be disabled, an alarm shall be displayed and the next available pump based on the selected alternation sequence shall be requested to start.
- T. In addition to the pump and alarm control capability, the controller shall provide alarm annunciation. The controller shall, upon the occurrence of an alarm, sound an audible device and flash the alpha-numeric display. The display will indicate the alarm description, complete with the time and date of the alarm occurrence. An acknowledge pushbutton shall be provided to allow silencing of the audible device while the digital display will continue to show the alarm function, complete with time and date information, until the condition has cleared. A built-in alarm and status historian shall retain the last 100 time and date stamped events providing a historical record of recent activity.
- U. The pump controller shall include a volumetric lift station flow and pump performance monitoring capability allowing station flow measurement without the use of an in line flow meter. In addition to flow measurement, the pump controller shall provide pump performance related information. Pump station flow and pump performance data shall be viewable locally through built in LCD or available for telemetry transmission to master station. The following information is to be provided:
1. Average Station Influent Flow Rate
  2. Maximum Station Influent Rate (K Gal) w/Date & Time
  3. Current Day Total Effluent Flow (K Gal)

4. Previous Days Total Effluent Flow (K Gal)
  5. Average Daily Effluent Flow (K Gal)
  6. Maximum Daily Effluent Flow (K Gal) w/Date & Time
  7. Total Station Effluent Flow (K Gal)
  8. Average Flow Rate Pump 1, 2, 3 Over All Cycles (GPM) – Each Pump
  9. Average Flow Rate Pump 1, 2, 3 Over Last Three Cycles (GPM) – Each Pump
  10. Total Flow Pump 1, 2, 3 (K Gal) – Each Pump
  11. Flow Rate Pumps 1, 2 (K Gal)
  12. Flow Rate Pumps 1, 3 (K Gal)
  13. Flow Rate Pumps 2, 3 (K Gal)
  14. Flow Rate Pumps 1, 2, 3 (K Gal)
  15. Pump 1, 2, 3 Low Flow Rate Alarm (Setpoint) – Each Pump
  16. Pump 1, 2, 3 Run Time – Each Pump
  17. Pump 1, 2, 3 Number Of Starts – Each Pump
  18. Pump 1, 2, 3 Average Number Of Starts – Each Pump
- V. The pump controller shall have one (1) RS-232C serial communications port that shall be available for telemetry communications. The RS-232 serial port shall support open communication standards including as a minimum, MODBUS RTU or ASCII and US Filter Open. Unit shall support communication data rates of 1,200 to 38,800 baud rates. On board communication diagnostic LEDs shall be available to provide indication of communications activity for verification and troubleshooting.
- W. Unit shall be constructed for industrial applications for use in harsh environments. Unit shall have a Temperature Operating range of -40 to + 85 Deg C, and be able to operate in environments with 10-90% non condensing humidity. Unit shall be UL Listed and in compliance with FCC part 15 Class A emissions and CE IEC61000 Surge Withstand certifications.
- X. All connections shall be made via plug-in terminal blocks with a minimal rating of 10 Amps, 300 Volts and capable of accepting 30-12 AWG wire.

5.03 TRANSDUCER

- NOT OFFICIAL!  
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the Lake County Recorder!
- A. The liquid level transducer shall be a 4 to 20 MADC, 2 wire, 15 to 40 VDC loop powered type with its output signal directly proportional to the measured level excursion over a factory calibrated range of zero to 10 feet of water.
  - B. The transducer shall be of solid state head-pressure sending type, suitable for continuous submergence and operation and shall be installed in accordance with the manufacture's instructions. The bottom diaphragm face of the sensor shall be installed 12 in. above the floor of the wet well. The sensor shall be mounted using a 1 in. vertical stainless steel pipe and cable system at the location shown on the drawings.
  - C. The transducer housing shall be fabricated of the 316 stainless steel with a bottom diaphragm 2 5/8 in. diameter of heavy-duty, limp, foul-free, molded Teflon bonded to a synthetic rubber back/seal. A hydraulic fill liquid behind the diaphragm shall transmit the sensed pressure to a solid state variable capacitance transducer element to convert the sensed pressure to a corresponding electrical value. The sensed media shall exert its pressure against the diaphragm which flexes minutely so as to vary the proximity between an internal ceramic diaphragm and a ceramic substrate to vary the capacitance of an electrical field created between an internal ceramic diaphragm and a ceramic substrate to vary the capacitance of an electrical field created between the two surfaces. A stable, hybrid, operational amplifier assembly shall be incorporated in the transducer to excite and demodulate the sensing mechanism. The transducer shall incorporate laser-trimmed, temperature compensation and high quality components and construction to provide a precise, reliable, stable output signal directly proportional to the sensed pressure over a factory calibrated range.
  - D. The transducer element shall incorporate high over-pressure protection and be designed to withstand intermittent over pressures five times the full scale range being sensed. Metallic

diaphragms shall not be acceptable in that they are subject to damage and distortion. Sensing principles employing LVDT's, resistive or pneumatic elements shall not be acceptable.

- E. The transducer shall include easily accessible offset and span adjustments in the upper assembly. Span shall be adjustable down to 15% of the sensor range. Fine and course adjustments for both span and offset shall be provided, using 25-turn potentiometers. Offset and span adjustments shall be non-interactive, for ease of calibration.
- F. The internal pressure of the lower transducer assembly shall be relieved to atmospheric pressure through a heavy duty urethane jacketed hose/cable assembly and a slack PVC bellows mounted in the NEMA 3R enclosure. The sealed breather system shall compensate for variations in barometric pressure and expansion and contraction of air due to temperature changes and altitude as well as prevent fouling from moisture and other corrosive elements.

#### 5.04 REDUNDANT CONTROL SYSTEM

- A. An independent high level alarm and redundant control capability with features here in after listed shall be provided in addition to the specified primary control system. It shall be powered by a 120 VAC circuit breaker (other than the one powering the primary system) and use one or more direct-acting float switches as described.
- B. The independent alarm/control panel equipment shall be designed to UL 508 Industrial Control Panel standards and shall incorporate a 120 VAC input transformer with transient protection, a fused primary and a DC power supply with limited 12 VDC to supply the level sensing float circuit(s). The control shall be used here with a single high level float switch arranged in the wet well at a higher elevation than the normal operating range of the primary control and alarm. The float switch shall be mounted in the wet pit in accordance with manufacturer's instructions or as shown on the plans. The front face of the controller shall incorporate a High Level Alarm LED, a Control Turn-On LED, a Control-Hold LED, a Control Contacts LED and a time adjustment with a 0 to 5 minute range.
- C. Upon the occurrence of a high level condition sensed by the high alarm float, the High Level Alarm red LED shall light, a form C SPDT alarm output contact circuit shall transfer to operate the specified alarm devices and two (2) form A, normally-open, redundant-control (10 amps/240VAC) circuits shall close to provide redundant pump operation. These control circuits shall be wired in parallel with the primary control system two-wire control circuits to provide a redundant capability. As the level recedes from the high level float, the alarm contact shall return to its normal setting of the off-delay timer. After that time interval (which is to commence following the lowering of the high level float) the control relay contacts are to re-open.
- D. The Control Turn-On and Control-Hold LED's and circuitry allow two additional floats to be used with the systems to provide differential-level automatic control in addition to the High-Level Alarm capability. When the differential level pump control is in use, the High Level Alarm circuitry is not generally connected to activate the control circuits in the redundant mode.
- E. The redundant control/alarm capability shall be completely integrated in the specified control panel and system as described and in accordance with all applicable codes and job requirements.

#### 6.00 STRUCTURAL ASSEMBLY

##### 6.01 GENERAL

- A. The generator and automatic transfer switch and other associated equipment are to be supplied as a complete assembly mounted on a single common base and enclosed within the fiberglass structure. All necessary wiring between the ATS, generator, and pump control panel are to be completed prior to shipment. Alternatives requiring field assembly or that have not been tested as a complete unit shall not qualify as equal product and shall not be accepted.

##### 6.02 SOUND ATTENUATED FIBERGLASS ENCLOSURE

- A. Fiberglass enclosure shall be of the Tip-Up design with hinge location as shown on the drawing. No major conduits will be attached to the enclosure. The enclosure shall be large enough to



accommodate inside storage of all specified equipment, including generator, transfer switch, and convenience accessories.

- B. The fiberglass enclosure shall have a gel coating of suitable thickness and density formulated to provide durability, abrasion resistance, color fastness, gloss retention, and shall be impervious to sewage, grease, oil, gasoline and other common chemicals. Gel coating shall be water resistant and shall meet or surpass ANSI Z-124.1-1974. Walls and ceiling shall be solid fiberglass, minimum 3/16th inch thick construction utilizing chopped strand with 18 oz. woven roving backed with polyester bonder per ASTM D-579 at the major stress points. Exterior fiberglass finish shall be smooth automotive type finish. Rough finish enclosures that allow for the collection of environmental elements that lead to the failure of the fiberglass, shall not be considered equal and shall not be accepted.
- C. In order to prevent leakage, the housing will be a single piece design enclosure. Multi-piece or seamed designs utilizing mechanically connected or caulked sections with different coefficients of thermal expansion, will not be accepted.
- D. The complete enclosure shall be designed to withstand a wind load of 120 miles per hour. The roof shall be capable of withstanding a loading of 30 pounds per square foot minimum.
- E. The exterior color shall be white for thermal reflection and attractiveness. The enclosure for the valve portion of the station shall contain a minimum 1 in. (R7) thick, 2 lb. density polyisocyanurate board applied to the interior of the housing. It shall be coated with an exterior white gell coating as specified above.
- F. Enclosure Opening
  - 1. Opening of the fiberglass enclosures shall be assisted by gas springs mounted inside the enclosure. The gas springs shall be sized such that the operator is not required to use more than 25 pounds of lifting force at the tip of the enclosure to the full open position. The enclosures shall be set up to open and close at a maximum rate of 1 ft. per 5 seconds. Gas spring shall be constructed of chrome rods, o-rings seals, non-metallic rod guides and a taper piston orifice to insure uniformity in dampening. It shall be mounted with ball sockets to allow for misalignment and eliminate the possibility of binding.
  - 2. When open, the enclosures shall be locked in position with a minimum of one (1) locking safety bar. Locking mechanism will consist of a T-handle pin inserted into the safety bar without personnel having to enter the housing. Safety bar shall prevent accidental closures or sudden movement of the enclosure due to wind gusts.
- G. Maximum sound additive level shall be 71.8 dB(A). Non-specified manufacturers will be subject to field verification of sound output per FIELD TESTING section of this specification.

#### 6.03 STEEL BASE ASSEMBLY

- A. The steel base shall be designed to mount and support the components defined in this section. The base will be of sufficient size to allow access for maintenance to these mounted items. The base shall be designed with adequate lifting points for installation as well as anchoring points as detailed on the contract drawings.
- B. The steel base shall be designed for the mounting of the fiberglass enclosure. The enclosure shall be secured to the steel base assembly utilizing stainless steel fasteners and a closed cell neoprene gasket. Design shall be such as to preclude the possibility of moisture entering the housing at the union of the fiberglass and steel.
- C. The base assembly shall be shot blasted to a commercial finish per SSPC-SP6. The base shall receive a minimum 10 mils epoxy paint similar or superior to Tnemec Series 66. The floor area of the base will receive an additional non-skid coating system.

#### 6.04 FUEL SYSTEM

- A. Properly sized fuel piping within the base shall be supplied by the manufacturer. It shall also include a manual shut-off valve, Y strainer, solenoid control valve, and flexible connection to the

engine at a minimum. Connection point for fuel supply shall be provided on the exterior portion of the base as shown on the contract drawings.

#### 6.05 INTAKE AND EXHAUST LOUVERS

- A. The system shall include a complete intake and exhaust system designed to provide an adequate amount of air for both cooling and combustion. The system shall consist of intake and exhaust louvers, and radiator duct discharge assembly.
- B. The louvers shall be certified AMCA Standard 500 at a maximum of 0.35 in. WG while the engine generator set is operating at full load. Louvers shall be 2 in., multi-blade, minimum 13 gauge extruded aluminum, 6063-T5 alloy, with 3/4 in. aluminum mesh removable bird screen.

#### 6.06 DUCT ASSEMBLY

- A. Duct assembly shall be provided between the engine radiator and the exhaust louver. The duct assembly shall be designed to provide a minimum amount of restrictions and a smooth air flow from the radiator to the exhaust louver.

#### 6.07 ELECTRICAL ASSEMBLY

- A. All conduit and wiring shall be done in accordance with the latest edition of the National Electric Code.
- B. All conduits within the base shall be supplied by the manufacturer. Internal conduits shall be thin wall metallic tubing with set screw or compression type connections. Where flexibility is required flexible metallic conduit shall be used.
- C. Conduit connections for electrical service lines shall be provided on the exterior portion of the base as shown on the contract drawings. All couplings for field connection of conduits shall be of heavy wall steel construction and shall be continuously welded around their circumference. External conduits shall be rigid galvanized steel with threaded connections.
- D. The service pole and metering shall be provided by the installing contractor. A U.L. rated main disconnect switch, conduit and wiring between the power company termination and the standby power system shall be furnished and installed by the installing contractor.
- E. A load center for the convenience accessories shall be provided.

#### 6.08 CONVENIENCE ACCESSORIES

- A. A duplex GFI 120 volt convenience outlet shall be provided for AC "plug in" devices.
- B. An AC trouble light shall be provided for operator convenience.
- C. A 1.5 KW wall mounted thermostatically controlled electric forced air heater shall be provided. The heater shall also be locked out when the generator is running.

#### 7.00 OPERATION AND MAINTENANCE MANUALS

- A. Provide two (2) complete sets of operation and manuals covering all equipment within this specification. Manuals will be provided in a three ring binder that will be clearly labeled for the specific job. Contact information for the manufacturer and the local representative will be provided within the manual.

#### 8.00 START-UP AND TESTING

##### 8.01 FACTORY TESTING

- A. A complete test including all generator, transfer switch and environmental functions will be performed after assembly and before system is shipped to the jobsite. The test shall include simulated power outage and operation test of all components as a completed system related to generator, transfer switch, pump control and level sensing system, and environmental system. Factory test of components prior to final assembly shall not be an acceptable alternate to the complete system check. A copy of this report will be available upon request prior to start-up.

8.02 START-UP

- A. The manufacturer shall provide the services of an authorized factory representative to inspect the installation, make any necessary adjustments, and place the equipment into operation. The manufacturer's representative shall instruct the operating personnel in the operation and maintenance of the equipment. The manufacturer's representative shall note any deficiencies on the start up report and inform the appropriate party at the time of start up to remedy the deficiency or make the necessary repairs or adjustments as needed. The manufacturer shall provide one day(s) service to perform the above tasks. A start-up report shall be prepared by the technician during at the job site and will be available in typewritten form to the customer upon request.

8.03 FIELD TESTING

- A. Field verification of sound requirements shall consist of sound readings taken in the dB(A) scale at eight (8) equally spaced points around the unit at a 23 ft. radius. Readings are to be taken while the unit is in its normal operating position under full load conditions. Points are to be averaged for comparison to the specified sound output level. Failure to meet specified sound output levels will be grounds for rejection of the equipment.
- B. The equipment supplier shall provide one (1) day service to inspect the installation, place the system into operation, and properly train owner's personnel in routine maintenance of the unit. A start-up report shall be prepared by the technician at the job site and will be available in typewritten form to the customer upon request.

9.00 MANUFACTURED EQUIPMENT

- A. These specifications are based on the certain products deemed most suitable for the application involved. The following manufacturer's equipment has been used for the basis of the above specifications.  
Packaged Generator: Precision Systems  
Generator: Cummins-Onan  
Transfer Switch: Cummins-Onan
- B. All equipment specified above shall be supplied by the pump station manufacturer; providing a single source service and warranty facility.
- C. Alternative manufacturers will be considered only if one or more bidding contractor(s) presubmit all materials required to review the alternative design, two (2) weeks prior to bid date. A minimum of six (6) complete equipment submittals shall be provided for review and approval. Costs associated with the review of alternative equipment shall be the responsibility of the submitting contractor.
- D. Any acceptable alternates will be identified by addendum. Price deducts for acceptance of alternative equipment from specified equipment will be passed to the owner and thus identified on bid form.

10.00 WARRANTY

- A. The manufacturer shall warrant for one year from date of start-up, not to exceed eighteen months from date of shipment, that the structure and all equipment will be free from defects in design, material and workmanship.
- B. The generator and transfer switch shall be provided with prorated, five (5) years or fifteen hundred (1500) hours warranty, whichever occurs first from the date of system start-up. Coverage includes replacement parts for the entire coverage period. Labor to replace these parts is also included for the first two (2) years.
- C. If replacement of equipment is deemed necessary by the manufacturer, all push-pull labor charges for removal of equipment and reinstallation of new equipment shall be covered by the manufacturer for the first year of operation.

- D. This warranty is contingent upon the initial start up of the equipment being performed by the manufacturer or its assigned authorized representative.
- E. This guarantee only covers defects which have developed in the service for which the equipment has been designed.
- F. The repair or replacement of parts normally consumed in service, such as light bulbs, is considered part of routine maintenance and such parts are not eligible for repair or exchange under this warranty.



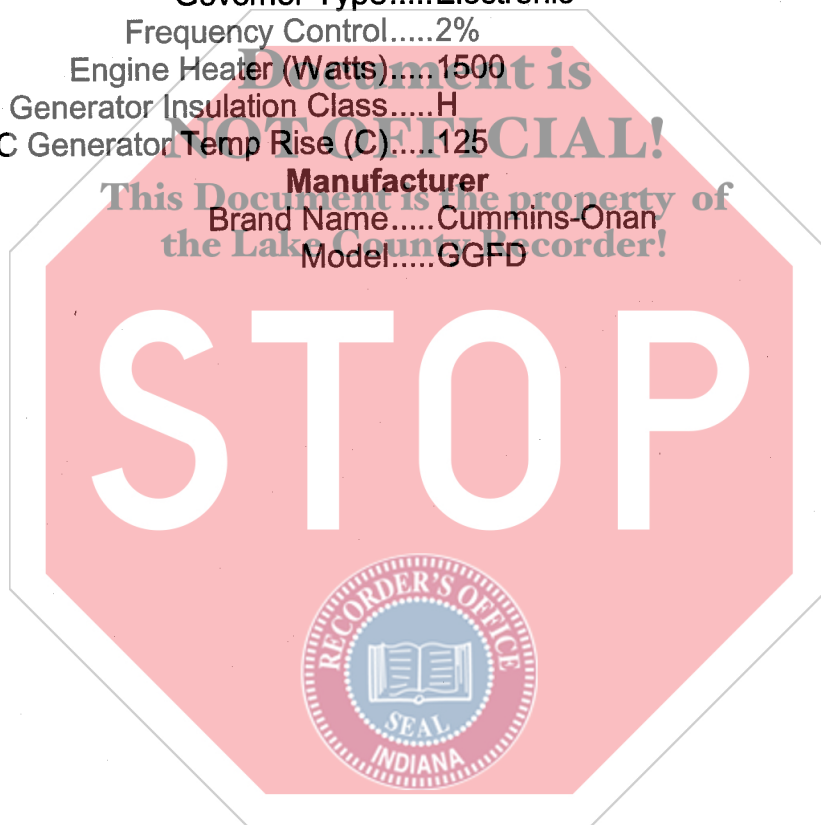
**TABLE 1**  
**Engine Generator Operating Parameters**

Phase.....3  
Wire.....4  
Voltage(V).....460  
Hertz (Hz).....60  
Rating (KW).....35  
Rating (KVA).....44  
Starting Rating (KW).....46.3  
Starting Rating (KVA)..... 155

**TABLE 2**  
**Generator Characteristics**


Cylinder Quantity.....6  
Engine Displacement (in3).....256  
Horsepower Output (HP).....67  
Fuel Type.....Natural Gas  
Min. Fuel BTU Rating (BTU/cu. Ft.).....NG 1000  
Governor Type.....Electronic  
Frequency Control.....2%  
Engine Heater (Watts)..... 1500  
AC Generator Insulation Class.....H  
AC Generator Temp Rise (C).....125

**Manufacturer**  
Brand Name.....Cummins-Onan  
Model.....GGFD



**AFFIRMATION TO RECIPROCAL ACCESS, UTILITY, PARKING  
AND STORM DRAINAGE EASEMENT AGREEMENT**

I affirm, under the penalties of perjury, that I have taken reasonable care to redact each Social Security number in this document, unless required by law.



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