Town of Altavista

J.R. "Rudy" Burgess Town Hall
510 7th Street
Altavista, VA 24517

Town Council
Work Session Agenda

Tuesday, August 23, 2016

5:00 PM Council Work Session

1. **Call to Order**
2. **Agenda Amendments/Approval**
3. **Public Comments –Agenda Items Only**
4. **Introductions and Special Presentations**
5. **Items for Discussion**
    a. **Boat Ramp Signs – Farmer Family**
    b. **Transportation Issues**
        i. **VDOT Main Street Paving/Marking**
        ii. **Lynch Mill Road improvement concepts**
    c. **Woodard & Curran**
        i. **Project Update**
            1. **Water Treatment Plant Electrical Evaluation**
            2. **SCADA Water Plant Assessment Report – Phase 1 Proposal**
    d. **FY2016 Carryover Requests to FY2017**
6. **Public Comments – Comments are limited to three (3) minutes per speaker.**
7. **Adjournment**

NEXT SCHEDULED REGULAR TOWN COUNCIL MEETING: **TUESDAY, SEPTEMBER 13, 2016 @ 7:00 p.m.**

<u>Notice to comply with Americans with Disabilities Act:</u> Special assistance is available for disabled persons addressing Town Council. Efforts will be made to provide adaptations or accommodations based on individual needs of qualified individuals with disability, provided that reasonable advance notification has been received by the Town Clerk's Office. For assistance, please contact the Town Clerk's Office, Town of Altavista, 510 Seventh Street, Altavista, VA 24517 or by calling (434) 369-5001.

Thank you for taking the time to participate in your Town Council meeting. The Mayor and Members of Council invite and

WORKSESSION

Agenda Item __5a__

Town of Altavista, Virginia
Worksession Agenda Form

Date: August 23, 2016

Agenda Item: *Boat Ramp signs – Farmer Family*

Summary: Recently, Barry Farmer contacted the Town about the possibility of installing a sign at the Altavista boat launch in English Park. His family has installed signs at other boat launches in the area, in memory of his father, James Edward Farmer, who drowned in the river in 2004. Attached is correspondence from the Farmer's that tells "their story" and the success they have had with installing signs at other ramps.

Budget/Funding: Installation and maintenance of the sign.

Legal Evaluation: Town Attorney will be available for questions.

Attachment: Correspondence from Farmers; Photo

Council Recommendation:

☐ Additional Worksession ☐ Regular Meeting ☐ No Action

Barry Farmer <bfarmer333@gmail.com>
434-333-5112

Sign (It would attach)

1 message

Belinda Kramer <kramerbelinda@gmail.com> Wed, Aug 3, 2016 at 9:16 AM
To: Barry Farmer <bfarmer333@gmail.com>

August 2, 2016

SUBJECT: Town Of Altavista English Park Boat Landing

In June of 2016 Mr. John Martin lost his life on the Stanton River which has become over the years a popular recreation area for local residents and visitors as well to fish and play. People do not realize the danger of rivers such as; strong currents, snags and that water temperature can quickly turn a fun day into a very tragic life changing day for many.

Our dad James Edward Farmer passed away on the James River March 26, 2004. His day started out just like any other day that he was headed out to fish. A stop at Hardees on the way out with his best friend and longtime fishing buddy for breakfast. The boat was launched and in the river by 7 am. Dad did not like to wear a life vest "it just got in the way" and he thought was a good swimmer so he didn't need one. His friend wouldn't fish with him if he didn't wear one. He loved to fish and he enjoyed his friends company so he decided he would do wear it though he didn't won't to. Around 10:00 am that morning they decided to have some lunch (dads highlight of the trip...eating). As they were preparing to bring things in and motor over to the river bank, dad had gotten hot and took his life vest off. This changed our families and a dear friend's life forever. Dad reached in to pull the anchor up and for reasons unknown to us he fell into the river and the boat capsized. His friend had his life vest on and saw dad struggling down river from him. He swam with all he had and was able to catch up with dad and get his arms around him and hold onto him and swim to a rock that was in the middle of the river. The water temperature that day was 42 degrees. My dad passed away in his friends arms at the moment he grab him and was pulling him to safety. Fortunately a gentleman was plowing a garden near the river bank and his plow broke down and he heard the cry for help coming from the river and was able to start the rescue and recovery.

My family contacted Georgia Pacific who owns the property that the state boat landing is on to ask if we could put up a sign in memory of dad and to warn boaters of the great fun to be had on the river and to also warn them of the dangers and how it can change lives in a split second.

Zoe Myers public relations with Georgia Pacific contacted me due to they had to go through corporate attorney's for approval. Thinking this would take forever and probably not be approved because their headquarters are located in Atlanta and so far removed from the situation I didn't give it much thought. Within a few days I received a phone call from Zoe advising me not only had they approved the memorial but Georgia Pacific would pay for it. All they needed from me was what our family would like to have placed the sign. The sign was placed by Georgia Pacific and they contacted our family and offered for us to dedicate the sign in his memory publically if we wanted. On March 26, 2005 at 11:30 am our family dedicated the sign with local TV stations from Roanoke and Lynchburg, newspapers, Virginia Congressman Robert Hurt, Zoe Myers and Plant Manager from Georgia Pacific.

After the memorial our family handed out whistles in the community and at the local Rescue Squad and shared our story. Anything we could do to save another life and not have someone go through what our family and John's family have had to experience.

I have kept in touch with Zoe and before the sign was placed there were 3 plus drownings a year on the river. After the sign was placed there has only been 2 in 12 years. Other positive impact is that Georgia Pacific has placed along side of the memorial a large sign reminding river goers the dangers of the water and to wear life vest. People use to throw their trash around the area and it was hard to keep the area looking nice and clean. Since the sign has been up people respect the area and trash cans have been placed and are emptied on a regular bases.

I have attached photos of the signs located at the boat landing and hope that The Town of Altavista will consider using these signs or similar signs at the English Park Boat Landing.

Sincerely,

Faye Farmer
Barry Farmer
Belinda Kramer


Enjoy the river and all its beauty, catch loads of fish, have lots of fun, treasure the memories with your friend today and wear your life vest at all times. Don't remove it, not even for a second; it could cost you your life!
"We ain't caught no fish , but we've had a good time."
LAST WORDS OF
James Edward Farmer
March 26, 2004
Erected in loving memory by his family.

WORKSESSION

Agenda Item __5b__

Town of Altavista, Virginia
Worksession Agenda Form

Date: August 23, 2016

Agenda Item: *VDOT Transportation Issues*

Summary: At the last Town Council meeting we discussed several items regarding VDOT projects and felt it would be a good idea to have representatives come and update/discuss these items. Accordingly, VDOT representatives have been invited to the meeting to discuss the following items:

Main Street Paving/Marking: As you know, VDOT has been seeking to pave Main Street for the past few years, but opted to work with the Town and wait until the Main Street Waterline project was completed to do so. With the waterline project nearing completion, it is anticipated that paving could occur in middle to late September. Staff felt it would be a good idea to have VDOT update Council on the paving schedule, in addition, there has been some discussion about an alternative design for markings on Main Street that would reduce the # of travel lanes and dedicating a center lane for turning movements. I have attached some thoughts from VDOT on that issue. If this is something that Council would like to pursue, VDOT and staff feel public input would be needed.

Lynch Mill Road (at Altavista Elementary School): VDOT conducted a study at Council's request in 2015 in regard to this item. Last month Council adopted a resolution in regard to projects to be considered by VDOT under their SmartScale program. During Council's discussion, it was noted that the concept of installing a right turn lane in front of the school was not a solution that would totally address the issue of cars on the side of the road and traffic congestion in front of the school during the drop-off/pick up of students. VDOT had previously looked at other concepts that dealt with improvements on the school site to address the concerns, those concepts are included in your packet. One clarification in regard to Concept #1 "Right Turn Lane" is that the projected cost for that project was listed on a VDOT Project Sheet as "Estimated 2020 Cost: $2,330,000, when actually the projected cost is $936,598.

Budget/Funding: Town's portion, if any, is unknown at this time.

Legal Evaluation: Town Attorney will be available for questions.

Attachment: VDOT Main Street Marking Notes; VDOT 2015 Report/Recommendation; Lynch Mill Road Concepts; Lynch Mill Road Right Turn Lane Cost Estimate

Council Recommendation:

☐ Additional Worksession ☐ Regular Meeting ☐ No Action

From: Harter, Gerry (VDOT)
Sent: Thursday, August 04, 2016 4:05 PM
To: Austin Sr., Donald L. (VDOT)
Cc: Conner, Matthew L., P.E. (VDOT); Gibson, Marie G. (VDOT); Booker, Anne K. C., P.E., PTOE (VDOT)
Subject: Preliminary Review of 4-lane to 3-lane conversion of Main Street in Altavista

Don

We have completed a very precursory review of the above scenario and offer the comments below. It should be noted that this roadway is approximately 39-42 feet wide which is enough for two through lanes, a TWTL but really nothing else except maybe 1-2' shoulders. Per your conversation with the Town, they did not want parking lanes or bike lanes. We could decrease lane widths to 10', the TWTL to 12' and possible get 4' bike lanes but these dimensions are very narrow.

1. CON - Preforming a <u>generalized</u> capacity review, there is a small drop in capacity going from a 4-lane undivided roadway to a 3-lane roadway with a TWTL. Using the generalized info, there is approx. a 5 MPH reduction in speed and an increase in delay. . Other studies have shown a small drop in capacity to no appreciable change in operating conditions. The corridor went from an LOS D in the 4-lane scenario to an LOS E for the three lane. If the Town is concerned about the capacity drop, we really should try to get some fresh count data and analyze this more rigorously.
2. PRO - Studies have shown a significant decrease in crashes with this conversion. The Study "THE CONVERSION OF FOUR LANE UNDIVIDED URBAN ROADWAYS TO THREE LANE FACILITIES, Welch 1999" also shows a reduction of (excluding signalized intersections) 43 percent in rear end crashes, 38 percent reduction in sideswipe passing crashes, 15 percent reduction in right angle crashes and a 100 percent reduction in head on crashes. The HSM also generally shows a significant reduction for 4-lane roadways that undergo a road diet. Since 2006, this road has experienced 65 crashes with 30 injury crashes, 34 property damage only crashes and 1 fatal crash. Of these crashes, there were 23 rear ends, 32 angles and 8 side-swipe same direction crashes, all of which can be reduced with this conversion. There were no head on crashes documented but then again we did not go through each FR-300.
3. PRO/CON – Fire/EMS access – with the removal of one of the through lanes, it is possible that a Fire/EMS vehicle may have a little more trouble getting to their destination. However, most Fire/EMS vehicles will use the TWTL if they need a clear lane.
4. PRO/CON – inability to pass – while converting to a 3-lane facility from a 4-lane facility does eliminate the ability to pass another vehicle, it does provide for a safer corridor for both peds and vehicles which was discussed in Number 2 above.
5. PRO/CON – increased delay at driveways – the conversion will reduce gaps since all traffic will be in one lane versus two. The positive here is that vehicles have less lanes to cross, less blind spots, and can also make a two stage crossing by using the TWTL to rest.

Summary – Conversion to a 3-lane facility may be a viable alternative for this corridor, especially if the Town wants to slow traffic down, provide safer opportunities for vehicles to cross or make lefts from the mainline, improve conditions for pedestrians, and generally improve safety along the corridor. As stated above, we would like to spend a little more time analyzing the capacity reduction if the Town is serious about this road diet. I will be out of town for the next week and a half so you can discuss with Matt if you need anything else. Thanks

Gerry Harter, P.E. PTOE
Area Traffic Engineer - SWRO
Virginia Department of Transportation
4219 Campbell Avenue
Lynchburg, VA 24501
Office: 434-856-8211
Fax: 434-947-2465

Southwestern Region

TRAFFIC ENGINEERING WORK ORDER

TO: Gerry L. Harter, P.E., PTOE
DISTRICT: Lynchburg
e-mail to Marie.Gibson@VDOT.Virginia.gov

FR: Rick Youngblood, District Planner
DISTRICT: Lynchburg

Received By: (Name)	Town of Altavista	Location:	
Received From: (Name)	Town Council	Address:	
Phone #:		City, State, Zip:	

County:	**Campbell / Town of Altavista**	Subdivision:	
Route:	**Route 714 (Lynch Mill Road)**	Specific Location:	Altavista Elementary School
Area:	Town of Altavista		
District:	Lynchburg		

Description of Request
Date: 01/29/15

The Town of Altavista requests VDOT to perform a study of the existing traffic patterns (including ques. turning volumes and stacking) and volumes on Lynch Mill Road in the area of Altavista Elementary School. This study should provide recommendations to improve operations and safety. A copy of the Town Resolution is provided for your reference and file. The address of the School is 2190 Lynch Mill Road.

The Principle at the School is Mrs. Amy Abell and her contact number is 434-369-5665

I will be happy to provide any assistance as needed for the study.

Traffic Engineering Recommendation
Date: 03/09/15

Work Scope: A Traffic Engineering Review has been conducted in the vicinity of Altavista Elementary School in the Town of Altavista to study traffic patterns and volumes related to the school along the surrounding roadway network. Resulting from this study are several recommendations to improve traffic flow and increase safety along the surrounding roadway network.

Existing Conditions and Crash Data: Altavista Elementary School is located along Urban Route (UR) 1466 (Lynch Mill Road) in the Town of Altavista, approximately 0.50 miles east of the Route 29 (Wards Road) overpass. Several other routes intersect Lynch Mill Road in the vicinity of Altavista Elementary School, which are noted later in this report.

UR 1466 (Lynch Mill Road)
Lynch Mill Road is a Rural Major Collector roadway with an approximate 22- to 24-foot pavement width and 2- to 5-foot grass shoulders. Both the pavement and shoulders are in good condition. The vertical alignment is good, whereas, the horizontal alignment is fair due to mild curves approaching the school. There is an existing 100 foot right turn taper along Lynch Mill Road eastbound (EB) to UR 10 (Ogden Road) and an existing 200 foot right turn lane along Lynch Mill Road westbound (WB) to the school bus entrance. Existing signage along this route includes School Zone Signs, School Speed Limit Signs, End School Zone Signs, and No Stopping/Standing/Parking Signs. Existing pavement markings along this route include centerline, edgeline, and two (2) SCHOOL pavement messages. Existing development along this route includes a gas station and office buildings in the vicinity of the school. This roadway is governed by a posted 35 MPH Speed Limit. The

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year 2013 Annual Average Daily Traffic (AADT) publication reveals a volume along Lynch Mill Road of 4,300 vehicles per day (vpd) from the North Corporate Limits (NCL) of the Town of Altavista to UR 7 (Frazier Road), a distance of 0.40 miles, and 3,400 vpd from Frazier Road to UR 1468 (Clarion Road), a distance of 0.49 miles.

UR 10 (Ogden Road)
Ogden Road is a Rural Minor Collector roadway with an approximate 25-foot pavement width and variable 2- to 5-foot grass shoulders. Both the pavement and shoulders are in good condition. The vertical alignment is good, whereas, horizontal alignment is fair due to a slight curve on the approach to UR 1466. Existing signage along this route includes Chevrons, a STOP Sign, and a 35 MPH Speed Limit Sign. This route is equipped with centerline pavement markings and is governed by a posted 35 MPH Speed Limit. The development along this route is primarily residential. Ogden Road intersects Lynch Mill Road approximately 275 feet west of the westernmost entrance to the school (bus entrance). The year 2013 AADT publication reveals a volume of 1,200 vpd along Ogden Road from UR 4 (Avondale Drive) to Lynch Mill Road, a distance of 0.38 miles.

UR 7 (Frazier Road)
Frazier Road is a Rural Minor Collector roadway with an approximate 22-foot pavement width and variable 3- to 5-foot grass shoulders. Both the pavement and shoulders are in good condition. The vertical and horizontal alignments are both good. Existing signage along this route includes a STOP Sign and a 35 MPH Speed Limit Sign. This route is equipped with centerline pavement markings and is governed by a posted 35 MPH Speed Limit. The development along this route is primarily residential. Frazier Road intersects Lynch Mill Road directly opposite the central entrance to the school, creating a crossroads junction. The year 2013 AADT publication reveals a volume of 2,500 vpd along Frazier Road, from UR 8 (Lola Avenue) to Lynch Mill Road, a distance of 0.62 miles.

Lakewood Drive
Lakewood Drive is a Rural Local roadway with an approximate 19-foot pavement width and variable 2- to 8-foot grass shoulders. Both the pavement and shoulders are in good condition. The horizontal alignment is good, whereas, vertical alignment is fair due to an incline approaching Lynch Mill Road. Existing signage along this route includes a STOP Sign and a 25 MPH Speed Limit Sign. This route is not equipped with any pavement markings and is governed by a posted 25 MPH Speed Limit. The development along this route is primarily residential. The year 2013 AADT publication reveals a volume of 1,200 vpd along Lakewood Drive, from Sourwood Lane to Dogwood Lane, a distance of 0.13 miles.

Altavista Elementary School Entrances ***(see Figure 1)***
There are three (3) entrances to Altavista Elementary School, with the westernmost entrance being dedicated to school bus traffic only. The majority of the school buses approaches the school from the east and turns right into the westernmost entrance and exit from the same entrance, as indicated by the yellow arrows in Figure 1. The current traffic flow pattern for student pick-up / drop-off involves parents entering the school from the central entrance, turning right into the leftmost lane, looping left around the parking lot towards the pick-up / drop-off zone, entering the pick-up / drop-off zone in front of the school, looping left around the parking lot and stopping on the approach to the central entrance, continuing straight into the right rightmost lane (beside the entering traffic in the leftmost lane) when the way is clear at the central entrance, and then turning right to get to the easternmost entrance to exit as indicated by the green arrows in Figure 1.

- Continued -

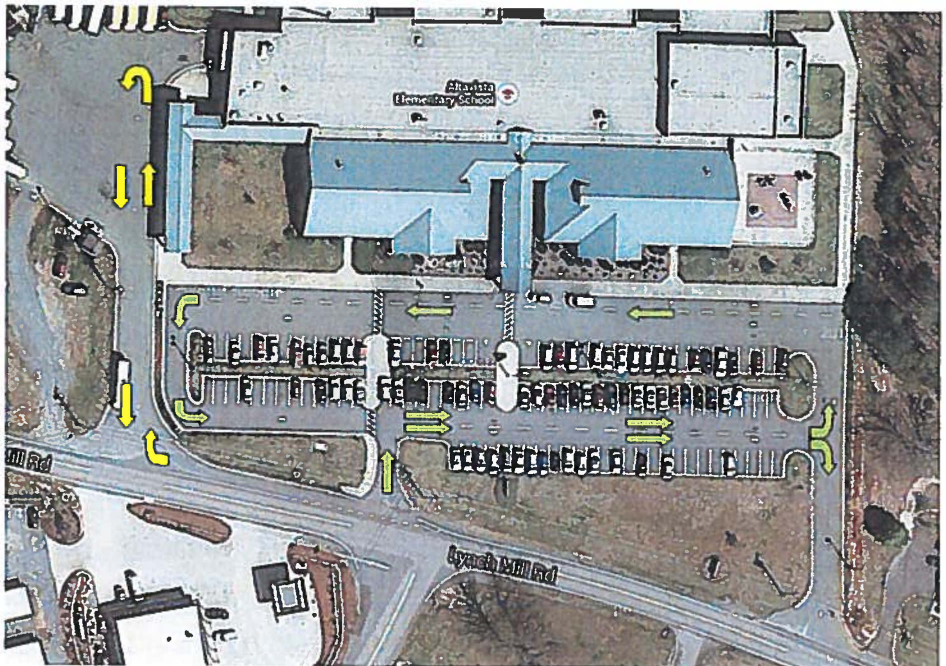

Figure 1 – Existing Flow

Crash History
Crash history along Lynch Mill Road was obtained to determine if any crashes resulted from traffic originating or terminating at the school. The most recent three (3) years of available crash data, from December 1, 2011, to November 30, 2014, reveals that there has been one (1) reported crash on Lynch Mill Road between the Northern Corporate Limits (NCL) of the Town of Altavista and Clarion Road, a distance of 0.89 miles. This crash was a Rear End crash that occurred away from the school, in the vicinity of Clarion Road, which may have resulted in speeding. Two (2) injuries and $14,500 of property damage resulted from this crash. This crash occurred on a weekend and was not related to any school activity.

Analysis: The primary concerns provided by the Town of Altavista in a formal resolution to VDOT are that 1) passenger vehicles and school buses are frequently blocking traffic on Lynch Mill Road and Frazier Road, 2) passenger vehicles and school buses are using the shoulder of Lynch Mill Road as a makeshift storage lane to allow vehicles to pass, and 3) the likelihood of crashes in the area is increasing due to the parents / buses blocking the through movement on Lynch Mill Road and/or utilizing the shoulder as a storage lane. The Town also noted in their resolution that if a future traffic study determined the need of the installation of a left turn lane into the school along Lynch Mill Road, the county would construct said turn lane. A previous Traffic Engineering study for a left turn lane into the school was conducted by VDOT in year 2011. At that time, traffic volumes did not warrant the installation of a left turn lane.

Dr. Tim Hoden of Campbell County Schools was contacted to get his perspective about the current school traffic situation. He noted that traffic was only a problem during pick-up time. He stated that arrival of the school buses is not staggered since they are coming from another school. He also stated that traffic volumes vary from day to day. Based on this information, site visits were conducted on several different days to observe the noted traffic issues. Our findings from the site visits are listed below.

- Continued -

Friday, February 6 - Student Pick-up

Friday pick-up was observed on February 6, 2015. At time of arrival to the study site at 2:10 PM, there were fifteen (15) passenger vehicles present in queue for student pick-up within the school's parking lot. The student pick-up queue began extending onto Lynch Mill Road at 2:50 PM. The first group of school buses arrived at 3:05 PM. The last bus left the school at 3:28 PM and the last parent left the school at 3:30 PM. Turn movement counting began at 2:15 PM. Twenty-one (21) passenger vehicles turned left into the school and fifty-five (55) passenger vehicles turned right into the school (including vehicles that originally approached from the west, but travelled past the school, U-turned, and entered from the east). Nineteen (19) school buses turned into the school bus entrance, all making right turns. The largest observed queue for passenger vehicles on the eastbound shoulder of Lynch Mill Road consisted of thirteen (13) passenger vehicles. The largest observed queue for buses in the eastbound right turn lane to the westernmost entrance on Lynch Mill Road consisted of four (4) school buses. The maximum time the westbound lane of Lynch Mill Road was blocked was approximately two (2) minutes, and the maximum time the eastbound lane was blocked was approximately one (1) minute.

Monday, February 9 - Student Pick-up

Monday pick-up was observed on February 9, 2015. At time of arrival to the study site at 2:10 PM, there were eleven (11) passenger vehicles present in the queue for student pick-up within the school's parking lot. The student pick-up queue did not extend onto Lynch Mill Road at any time during student pick-up. The first group of school buses arrived at 3:05 PM. The last school bus left the school at 3:20 PM and the last parent left the school at 3:30 PM. Turn movement counting began at 2:15 PM. Thirty-two (32) passenger vehicles turned left into the school and forty-one (41) passenger vehicles turned right into the school. Seventeen (17) school buses turned into the school bus entrance, all making right turns. The largest observed queue for buses on Lynch Mill Road consisted of four (4) school buses. The maximum time the eastbound lane of Lynch Mill Road was blocked was approximately two (2) minutes. The westbound lane was not blocked at any point during student pick-up.

Tuesday, February 10 - Student Drop-Off

Tuesday drop-off was observed on February 10, 2015 from 7:30 AM to 8:15 AM. It was observed that the majority of passenger vehicles approached the school from the west, turning left into the school. The maximum time the eastbound and westbound lanes of Lynch Mill Road were delayed was approximately two (2) minutes. This delay was the result of motorists not following the established traffic control at the entrance, which regulates that entering traffic has the right-of-way and exiting traffic has to stop at the STOP Sign. For this particular instance, a passenger vehicle started entering the school parking lot at the central entrance, but had stopped within the entrance to allow an exiting vehicle (which was supposed to stop at the STOP Sign on its approach to the central entrance) to continue through without stopping. Other exiting vehicles followed this same pattern of not stopping at the STOP Sign, thereby blocking entering traffic and preventing it from turning off of Lynch Mill Road. This delay could be avoided if traffic patterns were observed.

Tuesday, February 10 - Student Pick-up

Tuesday pick-up was observed on February 10, 2015. At time of arrival to the study site at 2:10 PM, there were thirteen (13) vehicles present in the queue for student pick-up within the school's parking lot. The student pick-up queue began extending onto Lynch Mill Road at 2:58 PM. The first group of school buses arrived at 3:03 PM. The last school bus left the school at 3:23 PM and the last parent left the school at 3:30 PM. Turn movement counting began at 2:15 PM. Twenty-four (24) passenger vehicles turned left into the school and forty-two (42) passenger vehicles turned right into the school (including vehicles that originally approached

- Continued -

from the west, but travelled past the school, U-turned, and entered from the east). Eighteen (18) school buses turned into the school bus entrance, all making right turns. The largest observed queue along the eastbound lane of Lynch Mill Road included two (2) school buses and eight (8) passenger vehicles. The two (2) school buses were queued in the right turn lane to the school's westernmost entrance and the eight (8) passenger vehicles were queued along the shoulder. The through lanes of Lynch Mill Road were not blocked at any time.

In addition to these site visits, a turning movement count was taken at the intersection of Lynch Mill Road, Frazier Road, and the central entrance to the Altavista Elementary School on Tuesday, February 24, 2015 during the student pick-up period from 2:00 to 3:30 PM. The traffic volumes and turning movements were then used to perform a standard volume analysis for determining if any left or right turn lanes are warranted at this location based on the afternoon peak hour for school traffic. The turning movement count revealed that there were thirty-five (35) right turns and twenty-two (22) left turns into the school, and a total of 188 approach vehicles along the westbound lane of Lynch Mill Road and 141 approach vehicles along the eastbound lane. Using Figures 3-7 and 3-26 from Appendix F of VDOT's Road Design Manual (***see attached***), it was determined that neither a left turn lane nor a right turn lane meets the standard warrants at this location based on the school's afternoon peak hour traffic volumes. At this particular location, however, one must not only consider the standard volume warrants for turn lanes, but also how the queueing impacts Lynch Mill Road. The site visits revealed that the passenger vehicles queued along westbound lane of Lynch Mill Road did not significantly impede the through movements along the road, but the queues were significant enough (up to thirteen (13) queued passenger vehicles observed at one point) to at least consider the installation of a right turn storage lane on Lynch Mill Road.

Recommendations: Although interest was expressed in the Town's Resolution in having a dedicated left turn lane into the school, a left turn lane is neither warranted nor recommended at this time due to minimal delays and turning volumes. However, the following potential solutions may help ease congestion and/or queuing during the student pick-up period:

Potential Solutions:

- Because the storage space and room for maneuverability is limited in the bus parking lot, it would be beneficial to stagger the arrival times of the buses during student pick-up times to reduce the number of buses arriving at one time and, therefore, prevent the buses from queuing in the right turn lane along Lynch Mill Road to the school's westernmost entrance.

- Assign a school employee in the school parking lot to assist with traffic control for entering and exiting vehicles. This could be particularly helpful in resolving issued like the one observed during the morning drop-off period to prevent entering traffic from unnecessarily queuing along both directions of Lynch Mill Road, should traffic exiting the school disregard the STOP Sign on the approach to their central entrance.

- Install a 200-foot right turn lane with an approximate 25- to 50-foot taper along the westbound lane of Lynch Mill Road leading to the school's central entrance to provide a safe area to store passenger vehicles waiting to pick up students. This solution allows for the passenger vehicles to queue in a designated paved lane with rather than the grass shoulder. However, it should be noted that there is a possibility that installing this storage lane may impact the utility pole adjacent to the central entrance, the brick school sign, and a fire hydrant.

- Continued -

- Reconstruct the central school entrance into a two-way entrance and close the easternmost entrance. By doing this, all exiting traffic would use the central entrance to leave school's parking lot. Because of this, there would be two lanes available for double stacking queued passenger vehicles within the school parking lot, as opposed to the current practice of designating one of these lanes for exiting traffic only. This solution would reduce the number of passenger vehicles queueing along Lynch Mill Road and eliminate the need for the internal STOP Sign for exiting traffic at the central entrance. However, one potential drawback to this solution is that it may increase congestion at this entrance, as this would create a full 4-legged intersection with Frazier Road. Instead of assigning a school employee within the school parking lot to assist with traffic control, the local police may be needed to assist with traffic control on Lynch Mill Road under this scenario. Also, the arrival times of the school buses would have to be staggered in order to ensure that exiting traffic would not get blocked by buses on Lynch Mill Road under this scenario.

Traffic Engineering recommends that consideration be given to staggering the arrival times of the buses during the afternoon student pick-up period before any solution involving construction is implemented.

If you concur, please present these recommendations to the school to get their feedback.

RECOMMENDATION BY:	Matthew L. Conner, P.E., PTOE, Senior Traffic Engineer – SWRO Lynchburg
COMPLETED BY:	Rashmi T. Patel, EIT, Associate Engineer

DATE RECOMMENDED WORK COMPLETED: Traffic Engineering Review Complete

Concept 1: Right Turn Lane to Central Entrance for Parent Pick Up

Concept 2: Two-Way Central Entrance

Concept 3: Right Service Road for Parents

Concept 4: Right Service Road for School Busses

Concept 5: Left Service Road for School Busses

UPC: **

Project Cost Estimating System

SUMMARY PAGE

DISTRICT	LYNCHBURG
PROJECT NUMBER	Town of Altavista
CONSTRUCTION END YEAR	FY2019
UPC	****
AD YEAR	FY2019
RATE OF INFLATION TO AD	6.83%
ESTIMATE YEAR	FY2016
INFLATION RATE DURING CN	N/A
Date of previous estimate	N/A
PROJECT MANAGER / DESIGNER	Right Turn Lane for School
Preliminary Engineering Estimate:	MANUAL
Construction Estimate:	PCES
Right-of-Way Estimate:	MANUAL
Utilities Estimate:	PCES
DATE	*08/17/2016*

THE FOLLOWING DATA WILL BE PROVIDED UPON COMPLETION OF THE REMAINDER OF THE WORKBOOK, WHICH IS ACCESSED BY SELECTING THE **CONST**, **RW**, & **UTIL** TABS BELOW

CONSTRUCTION ESTIMATE	*$549,877*
PRELIMINARY ENGINEERING ESTIMATE	*$50,000*
RIGHT-OF-WAY & UTILITIES ESTIMATE	*$336,721*
TOTAL PROJECT ESTIMATE	*$936,598*

Revised 06/16/15

Estimate Class: Blank

Version 5.00

WORKSESSION

Agenda Item __5c__

Town of Altavista, Virginia
Worksession Agenda Form

Date: August 23, 2016

Agenda Item: *Utility Project Updates by Woodard & Curran*

Summary: Previously, the Town tasked Woodard & Curran, one of the Town's annual contract engineers, with several studies/analysis in regard to components of our utility operations. At this time, we are ready to update Town Council on two of the items they have been working on. The two items are:

Water Treatment Plant Electrical Evaluation: As you know, a previous engineering firm reviewed the electrical system at the WTP and proposed that it be upgraded and that a separate building be used for the equipment. The Town earmarked funds in Reserves for this project at the time in the amount of $450,000. However, staff had a discussion with Woodard & Curran about this project and they felt there were some other alternatives, which did not include a separate building. Attached is their evaluation of the electrical system and their recommendation, with a revised Estimated Cost of $390,000.

SCADACheck – Phase 1 Proposal: The Town also tasked Woodard & Curran with conducting a SCADACheck to create a phased SCADA implementation plan. The SCADACheck (*Water System SCADA Assessment Report)* was distributed via separate email, due to file size. Based on a recent meeting with Turner Perrow of Woodard & Curran, the implementation of Phase 1 of the SCADA system is ready to be designed and installed. This phase would address the Abbott Nutrition connection, The Water Treatment Plant Polling Master and the Melinda Tank Repeater at an estimated cost of $80,500. Implementation of "Future Phases" can be discussed at a future meeting.

Budget/Funding: The Town has $450,000 "earmarked in Reserves for the Water Plant Electrical Upgrade Project. The FY2017 Budget has $145,000 allocated for SCADA System installation, this would be the first of a potential multi-year project.

Also enclosed are a Project Report and Schedule Update for all items that Woodard & Curran is working on for the Town. This is provided for Information Purposes Only at this time, items will be brought back for Council's consideration at the appropriate times.

Legal Evaluation: Town Attorney will be available for questions.

Attachment: W&C Electrical Evaluation Report; Revised Electrical Opinion of Probable Cost; Project Report; Project Schedule Update
The SCADA Assessment Report was included via separate email for Council Members.

Council Recommendation:

☐ Additional Worksession ☐ Regular Meeting ☐ No Action

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MEMORANDUM

TO: David Garret, Director of Public Works

FROM: Andrew Fitzpatrick, P.E., Patrick Halpin, P.E., Sean Tarbox, P.E., Michael Sims, P.E.

DATE: July 21, 2016

RE: Altavista, VA WTP Electrical Evaluation

PROJECT BACKGROUND:

Woodard & Curran (W&C) performed an electrical evaluation of the Altavista, VA Water Treatment Plant (WTP) and each of the 10 remote sites on May 23rd through May 25th. The purpose of the WTP site investigation included inspecting electrical components and distribution equipment, specifically equipment currently located within a chemical room, identify alternate locations for new distribution equipment and evaluating the proposed conceptual design by others.

WTP DISTRIBUTION OVERVIEW:

The WTP is fed from a primary pole line along the access road to the WTP. The primary service is fed underground to a utility owned pad-mount transformer located on the Northeast corner of the building. The secondary conductors are routed along the rear of the building to a CT cabinet and meter. The 480V 3-phase, 4-wire service feeds the single section Square-D switchboard on the second floor with a 1600A main breaker with Micrologic electronic trip sensor. Next, the main breaker feeds a 1600A Caterpillar Automatic Transfer Switch (ATS) and then transitions down to the ground floor feeding a 1600A GE AV-Line switchboard main breaker section and distribution section located within the chemical room. The GE switchboard distributes power to the 100HP High Service Pumps, 50HP Backwash Pump, Raw Water Pumps at Reed Creek, wastewater panelboards and a 300kVA dry-type transformer also located within the chemical room. The transformer steps down 480V to 240V 3-phase and feeds an 800A Main Distribution Panelboard (MDP). The MDP then feeds (4) panelboards distributed throughout the WTP building and one of the Finish Water Pumps. One of these panelboards, 'Power Panel P', is located adjacent to the MDP in the chemical room. Power Panel P provides service to the second Finish Water Pump, the Sedimentation Basin Mixers and building unit heaters. Refer to Attachment A for a preliminary load list.

The WTP electrical service is backed up by a 625kVA, 500kW, 480V, 3-phase standby Caterpillar Generator located to the East of the building. The standby service is fed through a pull box adjacent to the CT cabinet directly to a 600A enclosed circuit breaker on the second floor of the WTP.

The WTP currently operates two Finish Water Pumps within the old building structure, two High Service Pumps and one Backwash Pump within the new building structure. In addition, there are ten Mixers in the sedimentation basins and three Raw Water Pumps located at the remote Reed Creek site, as well as various chemical metering pumps.

WTP ELECTRICAL CONDITIONS ASSESSMENT:

The utility owned pad mount transformer and utility meter are located in the rear of the building and considered less than ideal placement for this equipment. The transformer is located directly at the base of hillside which may act as collection point for rain water runoff. The transformer is showing significant signs of exterior deterioration.

Figure 1: GE Main Breaker

The condition of the GE main breaker and distribution section are showing signs of corrosion, rust and general deterioration on the front face panels as well as interior along the cable terminations and copper bus work. A significant amount of dust/dirt covers each bus phase as well as the cables. Refer to Figure 1 displaying the main breaker with protective panels removed. The figure shows the discoloration of the copper bus work with significant dust/dirt built up on the bus terminations.

The 300kVA transformer, also located within the chemical room, is in a poorly ventilated area with concrete walls on two sides and large diameter piping partially obstructing the third side. The transformer feeds the MDP on the opposite wall within the chemical room. The panelboards in the chemical room are showing signs of deterioration; however, they have been painted which conceals the physical indication. During the site investigation, the plant staff electrician did not recommend removing the cover trim plates with the concern that they would aggravate deterioration, cause inadvertent damage and may not be able to be re-installed. The panelboards were installed as part of the original plant construction and are well past their life expectancy.

Figure 2: Reed Creek Feeder Conduit

The panelboards have a number of branch circuits fed through conduits buried in the concrete floor. These conduits are also showing signs of damage with multiple cracks and signs of corrosion present. The chemical room contains Sodium Hydroxide and Alum tanks with associated chemical metering pumps. Both chemicals have the potential for chemical reaction with copper and galvanized steel.

The Reed Creek Pump and Raw Water Pumps are located on the exterior of the WTP, adjacent to Reed Creek. All the motors are fed through a single four-inch conduit which exits the WTP on the West side near the entrance. The conduit LB is cracked and exposes all conductors to the atmospheric conditions, allows ingress of water and possibly rodents. Refer to Figure 2. The junction box at the Reed Creek area is completely deteriorated and is unsafe in its current condition. Refer to Figure 3.

Figure 3: Reed Creek JB

Figure 4: Generator JB

The generator service feed junction box on the Northeast corner of the building is significantly deteriorated. The front cover has rusted enough to expose the interior to atmospheric conditions. Refer to Figure 4.

WTP STRUCTURAL CONDITIONS ASSESSMENT:

A preliminary structural analysis determined the existing floor structure is capable of supporting the equipment proposed in Attachment B, Drawing E30.01 The analysis was based on preliminary equipment locations, dimensions, and weights, and record drawings titled "Water Works Improvements for the Town of Altavista" by Wiley & Wilson Consulting Engineers dated March 5, 1965. After installation of the proposed equipment, the remaining live load capacity of the Third Floor Storage Room will be approximately 50 PSF. A placard stating the maximum permitted live load shall be posted.

The roof consists of a precast roof deck spanning in the east-west direction. These bear on pre-stressed concrete joist running the north-south direction. Any new openings in exterior walls should be located on the southern wall between roof beams. This location has the least impact on existing load paths.

WTP HVAC CONDITIONS ASSESSMENT:

The WTP currently operates a 36,000 BTU/HR convertible air handler with a split system heat pump mounted on a pad on the exterior of the building. The HVAC system heats and cools only the office spaces via air ducts using local thermostats for control. The WTP operates (12) 3kW ceiling hung electric unit heaters. The heaters are spread throughout the WTP building and provide heat for the process areas, chemical feed rooms and storage areas.

PROPOSED CONCEPTUAL DESIGN REVIEW:

W&C reviewed the conceptual design by W/W Associates dated 11/9/2015. There are a few concerns with the conceptual approach:

1. The existing utility service will remain, up to the point of connection to the ATS and will then exit the building to a separate distribution electrical room located to the Northwest of the WTP building. From a safety perspective, this approach needs to be clearly identified to avoid potential hazards for the Fire Department and local Authority Having Jurisdiction. Placards identifying the WTP main disconnecting means resides on the second floor within the WTP is recommended.

2. Motor controllers and panelboard feeders are located outside the WTP building, external to the field equipment, which may present an unclear method for operators to denergize the equipment. It is also may become tedious to exit the building to modify or inspect the motor controllers and operation.

3. The proposed location of the dry-type transformer would be directly in front of the WTP building and would be adjacent to the parking lot and entrance. The transformer would be located in an area exposed to potential damage from vehicles. Bollards were not identified on the conceptual drawing but would be recommended.

4. The proposed underground conduit ductbank routing may interfere with existing underground raw water and finish water piping.

5. The proposed design approach will be utilizing the existing panel location within the chemical room as a splice point for existing feeders and branch circuits. This approach will result in the re-use of conduits that are corroded or in poor condition.

PRELIMINARY DESIGN APPROACH:

W&C investigated potential alternatives to the conceptual design presented by W/W Associates. W&C's proposed alternative design approach includes demolishing the existing GE switchboard, 300kVA dry-type transformer and panelboards within the chemical room. Install a new 1600A MCC, new distribution dry-type transformer and Main Distribution Panelboard on the third floor of the building within the old chemical storage area, above Filter No. 1.

ELECTRICAL:

A new 1600A MCC will contain motor controllers for the High Service, Backwash and Raw Water pumps within a single piece of distribution equipment. It will provide a feeder to a new 225kVA dry-type transformer and 600A MDP within the new electrical room. The MCC will also provide feeders to Owner furnished, relocated, VFDs for the Finish Water Pumps. The new MDP will provide feeders to the existing panelboards within the WTP building, Mixer VFDs and unit heaters. A feeder will also be provided for Panel Z located at the wastewater treatment area at the exterior of the building. New feeders from the MDP will avoid re-using the conduits within the Chemical room.

Staff have identified the desire for Variable Frequency Drive (VFD) control of the Finish Water Pumps and High Service Pumps. The Backwash Pumps, Raw Water and Reed Creek Pumps will remain on motor starters.

The MCC will be configured with hard-wired controls for all motors and include the option of Ethernet communications to provide additional power monitoring information, fault, status and control information and general operating conditions of the motors. Refer to Attachment B for a preliminary one-line and proposed equipment layout. Refer to Attachment C for preliminary equipment selection.

The installation will require new conduits from the top of the existing ATS through the Filter No. 1 wall, transition up to the third floor and bottom feed the new MCC. The motor feeders from the MCC will be bottom fed out from the MCC into a conduit rack or cable tray raceway above Filter No. 1 along the ceiling to the vertical rack at the front of the Filter, adjacent to the current control station. The conduit or cable tray raceways will include feeders from the new MDP on the third floor to existing loads such as the Mixers and each existing panelboard. To access the ground floor for the process pumps, the raceways will pass through the floor where the existing chart recorder is located. The chart recorder will be required to be demolished or relocated.

The new electrical distribution equipment will be installed by partially removing the West wall and utilizing either a boom truck or crane to lift equipment in place. Setting equipment in place will require movable floor mounted lifting equipment capable of lifting at least 2000lbs to a height of 95-inches.

Motor feeders to the Reed Creek and Raw Water Pumps will utilize an existing spare underground 6" PVC conduit exiting the south end of the WTP. The existing 4" conduit will be cut, capped and abandoned in place.

STRUCTURAL:

- During construction the contractor may need to temporarily widen and shore a window opening to facilitate delivery of the electrical equipment. It is the responsibility of the contractor to ensure their solution safely supports any overhead loads.
- East facing third floor windows will be blocked in to allow for installation of MCC.
- Conduit core holes for all feeders are required to be installed between existing floor slab reinforcing. The contractor should coordinate conduit spacing with record drawings to minimize the number of reinforcing bars interrupted.
- The Virginia Uniform Statewide Building Code (USBC) incorporates the 2012 International Existing Building Code by reference. The space being altered is a former Chemical Storage Area. Alterations include the addition and elimination of doors and windows but affect less than 50 percent of the building area. They are considered a "Level 2 Alteration." A code review may be required by the local code enforcement officer to guarantee alterations maintain or increase the degree of public safety, health, and general welfare currently present. As the occupancy of this space would change to a less hazardous use and no additional lateral loads are proposed, no issues associated with this code review are a concern at this time. If required, this code review would be part of detailed design.
- As part of final design, a refined structural analysis utilizing a Finite Element Analysis (FEA) model will be created to ensure the floor slabs, beams and any additional penetrations have the capacity required per the USBC, and American Concrete Institute (ACI) Building Code.

HVAC:

- Based on preliminary heat load calculations, the new electrical room will require approximately 82,000 BTU/hr. of cooling during occupied times and 66,000 BTU/hr. during unoccupied times.
- Heating and cooling loads will be handled utilizing a Variable Refrigerant Flow (VRF) device located outside at ground level.
- Heating and cooling piping will be routed from the VRF unit to three (3) ceiling supported heating and cooling units in the proposed electrical room.
- Two (2) new louvers with motor operated dampers will be installed on the drawing east wall for ventilation.

- A new exhaust fan will be installed on the drawing north wall to provide the required amount of fresh air to the space and to provide cooling during summer months.

- A new electrical room door will be installed to prevent unnecessary conditioning of other spaces. This door will have standard panic exit devices and swing in the direction of egress as required by USBC & National Electric Code (NEC).

- The VRF unit will require a new 12" thick concrete pad to support the weight of the unit at ground level.

- Refer to Attachment C for preliminary equipment selections.

W&C RECOMMENDATIONS:

W&C recommends initiating a service inspection of 1600A Square-D main breaker and switchboard section on the second floor of the WTP building. This area has been subject to caustic chemical additions with evidence of splashing on the switchboard. The inspection will include inspecting the equipment for damage to the bus work, panels and any potential damage and operation of the main breaker. The Opinion of Probable cost includes a service inspection but not replacement of the circuit breaker.

W&C recommends modifying the existing chemical additions by extending the PVC piping further down within the extended 6" piping or providing splash guards to prevent chemical splashing. W&C assumes future effects of the chemical additions will be mitigated, which will ensure no further deterioration to the electrical equipment on the second floor.

W&C recommends replacing the generator pull box adjacent to the CT cabinet on the exterior of the WTP. The pull box is significantly deteriorated and exposes the conductors to atmospheric conditions and may allow ingress of rodents.

OPINION OF PROBABLE CONSTRUCTION COSTS:

The following table indicates W&C's Opinion of Probable Cost broken out by discipline, including design and construction administration fees. The electrical portion of the project is expected to represent the majority of cost.

Task	Description	Total Cost
1	General Conditions	$27,000
2	Insurance/OH/Profit	$65,000
3	Electrical Upgrades	$280,000
4	Architectural/Structural Upgrades	$12,500
5	Mechanical Upgrades	$41,000
6	Engineering Design Fees	45,000
7	Construction Administration	$15,000
8	Overall Project Contingency - %15	$73,000
	TOTAL	**$558,500**

ATTACHEMENTS:

Attachment A: Preliminary Load List

Attachment B: Conceptual One-Line and Layout

Attachment C: Preliminary Equipment Selection

Attachment A: Load List

DESCRIPTION OF LOAD	OCPD	Starter Type	LOAD		VOLTAGE	FULL LOAD	CONNECTED LOAD		DERATED LOAD		COMMENTS
	CB Size		hp	kVA	(V)	(A)	Factor	(kVA)	Factor	(kVA)	
MCC-1											
Finish Water Pump #1	70	VFD	30.00 hp		480V - 3ph.	40.00	1.00	33.2 kVA	0.00	0.0 kVA	old building, needs to be re-wired 480V
Finish Water Pump #2	150	VFD	60.00 hp		480V - 3ph.	77.00	1.00	63.9 kVA	0.00	0.0 kVA	
Backwash Pump #1	150	FVNR	60.00 hp		480V - 3ph.	77.00	1.00	63.9 kVA	1.00	63.9 kVA	Not connected currently, needs to be re-wired 480V
High Service Pump #1	250	VFD	100.00 hp		480V - 3ph.	124.00	1.00	103.0 kVA	1.00	103.0 kVA	new building
High Service Pump #2	250	VFD	100.00 hp		480V - 3ph.	124.00	1.00	103.0 kVA	1.00	103.0 kVA	
High Service Pump (future)	250	VFD	100.00 hp		480V - 3ph.	124.00	1.00	103.0 kVA	0.00	0.0 kVA	
Backwash Pump #2	125	FVNR	50.00 hp		480V - 3ph.	65.00	1.00	54.0 kVA	0.00	0.0 kVA	
Raw Water Pump #1	40	FVNR	15.00 hp		480V - 3ph.	21.00	1.00	17.4 kVA	1.00	17.4 kVA	Outside by reed creek
Raw Water Pump #2	40	FVNR	15.00 hp		480V - 3ph.	21.00	1.00	17.4 kVA	0.00	0.0 kVA	
Reed Creek Pump	50	FVNR	20.00 hp		480V - 3ph.	27.00	1.00	22.4 kVA	1.00	22.4 kVA	
HVAC	40			24.00 kVA	480V - 3ph.	28.87	1.00	24.0 kVA	0.80	19.2 kVA	
240V Transformer	600			225.00 kVA	480V - 3ph.	270.63	1.00	225.0 kVA	0.80	180.0 kVA	
Panel Z	100			65.00 kVA	480V - 3ph.	78.18	1.00	65.0 kVA	1.00	65.0 kVA	estimated load based on feeder breaker
TOTAL LOAD :								895 kVA		574 kVA	
								1078 A		691 A	
TOTAL LOAD + 25 % (kVA) :								1119 kVA		717 kVA	
TOTAL LOAD + 25 % (AMPS) :								1347 A		863 A	

Attachment B: Conceptual One-Line and Layout

GENERAL

- P1-## — HOME RUN. ARROWS INDICATE NUMBER OF CIRCUITS, CROSS LINES INDICATE NUMBER OF WIRES, OTHER THAN TWO (2) PLUS BOND, WIRE SIZE NOT SHOWN INDICATES #12AWG MIN.
- INDICATES CIRCUIT NUMBER
- PANEL DESIGNATION
- WIRING IN RACEWAY
- WIRING IN RACEWAY CONCEALED UNDERGROUND OR UNDERSLAB, MINIMUM 3/4"C
- 3/C #nn W/GND, EquipNo-P — CONDUIT AND CABLE ID TAG
- CONDUIT TURNING UP
- CONDUIT TURNING DOWN
- CONDUIT STUB
- EY CONDUIT SEAL
- FLEXIBLE NON-METALLIC CONDUIT
- PANELBOARD
- CP — CONTROL PANEL
- ATC — AUTOMATIC TEMPERATURE CONTROL PANEL
- ISBP — INTRINSIC SAFETY BARRIER PANEL
- POWER COMPANY METER
- HS H/O/A — LOCAL SELECTOR SWITCH: H/O/A – HAND/OFF/AUTO; H/O/R – HAND/OFF/REMOTE; L/O/R – LOCAL/OFF/REMOTE
- PUSHBUTTON STATION, WITH "EM" EMERGENCY
- J — JUNCTION BOX
- MD — MOTORIZED DAMPER
- T — THERMOSTAT
- R — RELAY
- B T — DOOR BELL/BUZZER AND TRANSFORMER – MTD CL UP 7'-0" AFF
- EQUIP# — EQUIPMENT TAGS
- X — KEYED NOTE TAG
- X — REVISION TRIANGLE
- BRACKET

POWER

- NON-FUSED SAFETY SWITCH
- F — FUSED SAFETY SWITCH
- NON-FUSED DISCONNECT/MAGNETIC MOTOR STARTER
- M — MANUAL MOTOR SWITCH (MOTOR RATED SWITCH), TOGGLE OPERATED, SINGLE PHASE. 1 OR 2 POLE AS REQUIRED
- CB 100A — ENCLOSED CIRCUIT BREAKER W/AMPERE RATING
- M — ELECTRIC MOTOR, NUMBER INDICATES HORSEPOWER RATING, "F" INDICATES FRACTIONAL LESS THAN 1/20HP OR 100W
- T — TRANSFORMER
- P — POWER POLE
- DUPLEX RECEPTACLE, NEMA 5-20R – MTD CL UP 24" OR AS NOTED."WP" WEATHER PROOF, "G" PROTECTED BY GFCI RECEPTACLE OR BREAKER UPSTREAM, "H" MOUNTED 0'-6" BELOW CEILING, "TV" MOUNT 7'-6" UP
- DOUBLE DUPLEX RECEPTACLE, NEMA 5-20R – MTD CL UP 24" OR AS NOTED
- SINGLE RECEPTACLE, NEMA 5-20R – MTD CL UP 24" OR AS NOTED
- GFCI DUPLEX RECEPTACLE, NEMA 5-20R – MOUNTED CL UP 48" OR 6" ABOVE COUNTER
- DOUBLE DUPLEX GFCI RECEPTACLE, NEMA 5-20R – MOUNTED CL UP 48" OR 6" ABOVE COUNTER
- FLUSH FLOOR OUTLET, DUPLEX RECEPTACLE, NEMA 5-20R
- MULTI SERVICE FLUSH FLOOR BOX WITH DUPLEX RECEPTACLE AND PROVISIONS FOR DATA
- POWER RECEPTACLE, NEMA CONFIGURATION AS NOTED OR AS REQUIRED FOR EQUIPMENT SERVED.
- FLUSH CEILING MTD DEVICE BOXES, ONE W/ DUPLEX RCPT FOR PROJECTOR POWER AND ONE FOR DATA TO SERVE OH PROJECTOR. RUN ONE 1 1/2"C TO JBOX LOCATED AT FRONT OF ROOM FOR PROJECTOR CABLE PATHWAY. VERIFY FINAL LOCATION W/ OWNER PRIOR TO ROUGH IN.
- MULTI-OUTLET POWER STRIP, MOUNT 0'-6" ABOVE COUNTERTOP, RECEPTACLE SPACING AS NOTED.

MISCELLANEOUS

- B / 80.01 — DETAIL #, SHEET #
- SECTION CALL OUT
- DETAIL TITLE, 1 / X-0X — DETAIL CALL OUT

LIGHTING

- 2x4 FLUORESCENT FIXTURE
- Ab — ASSOCIATED CONTROL DEVICE; FIXTURE TYPE (SEE LIGHT FIXTURE SCHEDULE)
- 1x4 FLUORESCENT FIXTURE
- 2x2 FLUORESCENT FIXTURE
- FIXTURE WIRED TO UNSWITCHED NORMAL CIRCUIT
- FIXTURE WIRED TO UNSWITCHED EMERGENCY CIRCUIT
- FIXTURE WIRED TO SWITCHED EMERGENCY CIRCUIT
- DOWN LIGHT
- FLUORESCENT STRIP
- WALL MOUNTED FIXTURES
- ab — POLE MOUNTED SITE LIGHTING FIXTURE; FIXTURE TYPE (SEE LIGHT FIXTURE SCHEDULE)
- FLOOD LIGHT
- EXIT SIGN, CEILING MOUNTED. ARROW INDICATES EGRESS DIRECTION. SHADING INDICATES SIGN FACE. NUMERAL INDICATES BATTERY UNIT CONNECTED
- EXIT SIGN, WALL MOUNTED 7'-6" AFF OR 0'-6" ABOVE DOOR. SHADING INDICATES SIGN FACE. NUMERAL INDICATES BATTERY UNIT CONNECTED TO.
- BATT — DUAL HEAD EMERGENCY LIGHT BATTERY PACK WITH NUMBER OF HEADS AS INDICATED – WALL MOUNTED MTD 7'-6" AFF. NUMERAL INDICATES BATTERY ID NUMBER.
- TANDEM EMERGENCY LIGHT BATTERY PACK & EXIT SIGN – WALL MOUNTED MTD 7'-6" AFF OR 0,-6" ABOVE DOOR. NUMERAL INDICATES BATTERY ID NUMBER.
- REMOTE EMERGENCY LIGHTING HEAD – WALL MOUNTED MTD 7'-6" AFF. NUMERAL INDICATES BATTERY UNIT CONNECTED TO.
- S — SINGLE POLE TOGGLE SWITCH – MTD CL UP 4'-0" AFF
- S_2 — DOUBLE POLE TOGGLE SWITCH – MTD CL UP 4'-0" AFF
- S_3 — 3-WAY TOGGLE SWITCH – MTD CL UP 4'-0" AFF
- S_4 — 4-WAY TOGGLE SWITCH – MTD CL UP 4'-0" AFF
- S_M — WALL MOUNTED OCCUPANCY SENSOR – MTD CL UP 4'-0" AFF
- S_P — TOGGLE SWITCH WITH PILOT LIGHT – MTD CL UP 4'-0" AFF
- S_D — DIMMER SWITCH – MTD CL UP 4'-0" AFF
- S_{LV} — LOW VOLTAGE SWITCH – MTD CL UP 4'-0" AFF
- a — OCCUPANCY SENSOR; a. INDICATES CONTROLLED FIXTURE
- PC — PHOTOCELL
- LC — LIGHTING CONTACTOR
- MS — MOTION SENSOR

FIRE ALARM DIAGRAM SYMBOLS

- FACP — FIRE ALARM CONTROL PANEL
- FAA — FIRE ALARM ANNUNCIATOR
- FCPS — FIELD CHARGER POWER SUPPLY
- M — FIRE ALARM MASTER BOX
- K — KNOX BOX
- F — FIRE ALARM MANUAL PULL STATION – WALL MTD CL UP 4'-0"
- H L — FIRE ALARM AUDIBLE/VISIBLE NOTIFICATION APPLIANCE CANDELA (CD) POWER PER NFPA 72 OR AS NOTED – WALL MTD BOTTOM UP 80" AFF. "H" HORN, "V" VOICE.
- L — FIRE ALARM VISUAL NOTIFICATION APPLIANCE CANDELA (CD) POWER PER NFPA 72 OR AS NOTED – WALL MTD BOTTOM UP 80" AFF
- CEILING MOUNTED SMOKE DETECTOR
- CEILING MOUNTED HEAT DETECTOR
- DUCT SMOKE DETECTOR S=SUPPLY, R=RETURN
- FS — SPRINKLER SYSTEM FLOW SWITCH
- TS — SPRINKLER SYSTEM TAMPER SWITCH
- PS — SPRINKLER SYSTEM PRESSURE SWITCH
- DH — FIRE ALARM SYSTEM MAGNETIC DOOR HOLDER
- Z — MONITOR MODULE
- C — CONTROL MODULE
- R — RELAY MODULE

COMMUNICATIONS

- TEL — TELEPHONE BACKBOARD
- WX — PROVISIONS FOR TELEPHONE OUTLET. TWO-GANG WALL BOX WITH ONE 1"C STUB TO ABOVE ACCESSIBLE CEILING – MTD CL UP SAME AS ASSOCIATED RECEPTACLE. W-INDICATES WALL MOUNTED AT 60" AFF. P-INDICATES PAYPHONE MOUNTED AT 4'-0" AFF. X-INDICATES NUMBER OF JACKS, SINGLE BOX
- PROVISIONS FOR DATA OUTLET. TWO-GANG WALL BOX WITH ONE 1"C STUB TO ABOVE ACCESSIBLE CEILING – MTD CL UP SAME AS ASSOCIATED RECEPTACLE. SUBSCRIPTS AS NOTED ABOVE.
- 2D2T — PROVISIONS FOR TELEPHONE & DATA OUTLET. TWO-GANG WALL BOX WITH ONE 1"C STUB TO ABOVE ACCESSIBLE CEILING – MTD CL UP SAME AS ASSOCIATED RECEPTACLE. SUBSCRIPTS AS NOTED ABOVE.
- PROVISIONS FOR SCADA SYSTEM OUTLET. TWO-GANG WALL BOX WITH ONE 1"C STUB TO ABOVE ACCESSIBLE CEILING – MTD CL UP SAME AS ASSOCIATED RECEPTACLE
- CEILING MOUNTED TELEPHONE SYSTEM OUTLET
- CEILING MOUNTED DATA SYSTEM OUTLET
- CEILING MOUNTED VOICE & DATA OUTLET
- FLUSH TELEPHONE FLOOR OUTLET
- FLUSH DATA FLOOR OUTLET
- FLUSH VOICE & DATA FLOOR OUTLET
- TV — TELEVISION COAXIAL OUTLET. MOUNTED UP SAME AS ASSOCIATED RECEPTACLE

SECURITY

- SEC — SECURITY PANEL
- DS — DOOR INTRUSION SWITCH
- DE — ELECTRIC DOOR STRIKE
- CR — CARD READER
- KP — KEY PAD
- MOTION DETECTOR
- CAM — SECURITY CAMERA; PTZ = PAN/TILT/ZOOM

INTERCOM & PAGING SYSTEM

- S — CEILING MOUNTED SPEAKER
- PA — PAGING SYSTEM CONTROL PANEL
- HS — PAGING SYSTEM HANDSET

INSTRUMENTATION

- LS / XX — FIELD MOUNTED INSTRUMENT; INSTRUMENT IDENTIFICATION TYPE; INSTRUMENT LOOP #
- FS / XX — VENDER SUPPLIED INSTRUMENT

INSTRUMENT IDENTIFIER:

AE	ANALYSIS ELEMENT
AIT	ANALYSIS INDICATING TRANSMITTER
AT	ANALYSIS TRANSMITTER
DPS	DIFFERENTIAL PRESSURE SWITCH
FCV	FLOW CONTROL VALVE
FE	FLOW ELEMENT
FIT	FLOW INDICATING TRANSMITTER
FT	FLOW TRANSMITTER
FS	FLOW SWITCH
LE	LEVEL ELEMENT
LIT	LEVEL INDICATING TRANSMITTER
LT	LEVEL TRANSMITTER
LS	LEVEL SWITCH
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH LOW
MOV	MOTOR OPERATED VALVE
PE	PRESSURE ELEMENT
PIT	PRESSURE INDICATING TRANSMITTER
PT	PRESSURE TRANSMITTER
PS	PRESSURE SWITCH
SV	SOLENOID VALVE
TE	TEMPERATURE ELEMENT
TIT	TEMPERATURE INDICATING TRANSMITTER
TT	TEMPERATURE TRANSMITTER
ZS	PROXIMITY SWITCH

MISC TERMINALS

- ARROW, SMALL
- ARROW, LARGE
- ARROW, TRIANGULAR
- CONTINUE, SMALL
- CONTINUE, LARGE
- DOT, SMALL
- DOT, MEDIUM
- DOT, LARGE
- POLARITY SQUARE
- SCREW TERMINAL
- TERMINAL POINT, SMALL
- TERMINAL POINT, LARGE
- TERMINAL POINT, SQUARE
- SHIELD
- SHIELD W/TERMINAL POINT

ONE-LINE DIAGRAM SYMBOLS

- 52 GCB1, CB 800A E.O — HV VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER ELECTRICALLY OPERATED
- 52 — MV VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER WITH MANUAL CONTROL SWITCH
- AT AF EO — LOW VOLTAGE CIRCUIT BREAKER: AF – AMP FRAME; AT – AMP TRIP; EO – ELECTRICALLY OPERATED
- ST — ST – SHUNT TRIP; GF – GROUND FAULT; EO – ELECTRICALLY OPERATED
- DISCONNECT, ISOLATION OR SAFETY SWITCH
- FUSED DISCONNECT SWITCH
- MAGNETIC MOTOR STARTER. NUMERAL INDICATES NEMA SIZE FVNR UNLESS OTHERWISE NOTED. FVR – FULL VOLTAGE REVERSING; RVAT – REDUCING VOLTAGE AUTO TRANSFORMER; 2S – TWO SPEED; YD – WYE DELTA REDUCED VOLTAGE STARTER
- CAPACITOR
- VFD — VFD = VARIABLE FREQUENCY DRIVE; SS = SOLID STATE STARTER; DC = DC VARIABLE DRIVE; NUMERAL INDICATES AMP RATING
- OA — POWER TRANSFORMER: OA – LIQUID TYPE SELF COOLED; AA – DRY TYPE SELF COOLED; FA – FAN COOLED; CONNECTION
- 480/120 — POTENTIAL TRANSFORMER; RATIO; NUMBER REQUIRED
- 600/5 — CURRENT TRANSFORMER; RATIO; PHASE
- 5 — MOTOR, NUMERAL INDICATES HORSEPOWER
- X — GENERAL LOAD, NUMERAL INDICATES LOAD IN KVA
- GENERATOR
- N E L ATS — ATS – AUTOMATIC TRANSFER SWITCH; MTS – MANUAL TRANSFER SWITCH
- A — METER: A – AMMETER; V – VOLTMETER; W – WATTMETER; KWH – KILOWATT HOUR; KVAR – KILOVAR METER; VAR – VAR METER; HZ – FREQUENCY METER; PF – POWER FACTOR METER
- LINE OR LOAD REACTOR NUMERAL INDICATES % IMPEDENCE
- DPM — DIGITAL POWER MONITOR
- AS — METER TRANSFER SWITCH: AS = AMMETER SWITCH; VS – VOLTMETER SWITCH
- SPD — SPD = SURGE PROTECTION DEVICE; ENDN = ETHERNET TO DEVICENET LINKING DEVICE; DPS = DEVICENET POWER SUPPLY
- MEDIUM VOLTAGE CABLE TERMINATION
- DRAWOUT DEVICE
- LA — LIGHTNING ARRESTOR
- K — KEY INTERLOCK

GROUNDING

- BARE COPPER GROUND CABLE. (SIZE 4/0 UNLESS OTHERWISE NOTED)
- 3/4Ø X 10'-0" LONG GROUND ROD. (10'-0" MINIMUM LENGTH)
- EQUIPMENT BOLTED CONNECTION OR APPROVED EQUAL.
- CADWELD EXOTHERMIC CONNECTION
- GROUND

CONTROL DIAGRAM SYMBOLS

NOTE: ALL CONTROL SYMBOLS ARE DRAWN ASSUMING DE-ENERGIZED CIRCUITS, EMPTY TANKS, UNPRESSURIZED LINES, ETC.

OPEN ON INCREASE / CLOSE ON INCREASE; NORMALLY CLOSED / NORMALLY OPEN

- PRESSURE SWITCH
- LEVEL SWITCH
- FLOW SWITCH
- TEMPERATURE SWITCH
- PUSH BUTTON
- INSTANTANEOUS CONTACT
- TIMED CLOSE CONTACT
- TIMED OPEN CONTACT
- LIMIT SWITCH
- H O A, XOO, OOX — SELECTOR SWITCH: QUANTITY OF ARROWS INDICATES NUMBER OF POSITIONS. XOO INDICATES UPPER CONTACT CLOSED IN LEFT POSITION AND OPEN IN CENTER AND RIGHT POSITIONS
- INTERNAL WIRING
- FIELD WIRING
- RELAY COIL

ABBREVIATIONS

A,AMP	AMPERES
AC	ALTERNATING CURRENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMPERE INTERRUPT CAPACITY
AWG	AMERICAN WIRE GAUGE
BFG	BELOW FINISHED GRADE
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CL	CENTER LINE
CKT	CIRCUIT
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CT	CURRENT TRANSFORMER
CU	COPPER
E.C.	ELECTRICAL CONTRACTOR
EMT	ELECTRIC METALLIC TUBING
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OTHERS
FWE	FURNISHED WITH EQUIPMENT
G.C.	GENERAL CONTRACTOR
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
G,GND	GROUND
HP	HORSEPOWER
HZ	FREQUENCY IN CYCLES/SECOND
IG	ISOLATED GROUND
IMT	INTERMEDIATE METALLIC CONDUIT
JBOX	JUNCTION BOX
K	KILO
KCMIL	1000 CIRCULAR MILS
KVA	KILOVOLT AMPERE
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
MCC	MOTOR CONTROL CENTER
MCB	MAIN CIRCUIT BREAKER
MFG	MANUFACTURER
MH	MANHOLE
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTR	MOTOR
MV	MEDIUM VOLTAGE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEUT	NEUTRAL
NO	NORMALLY OPEN
OL	OVERLOAD ELEMENT
PF	POWER FACTOR
PH	PHASE
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
RGS	RIGID STEEL CONDUIT
RTD	RESISTANCE TEMPERATURE DETECTOR
SEC	SECONDARY
SS	STAINLESS STEEL
SV	SOLENOID VALVE
TEMP	TEMPERATURE
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UE	UNDERGROUND ELECTRIC
UG	UNDERGROUND
UPS	UNINTERRUPTED POWER SUPPLY
V	VOLTS
VA	VOLT-AMPERES
VAR	VOLT-AMPERE REACTIVE
W	WATT
WM	WATT METER
WP	WEATHER PROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

PROPOSED CONCEPT. NOT FOR CONSTRUCTION

WOODARD & CURRAN
41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

REV | DESCRIPTION | DATE

DESIGNED BY: PFH | CHECKED BY: PFH | DRAWN BY: NTHB

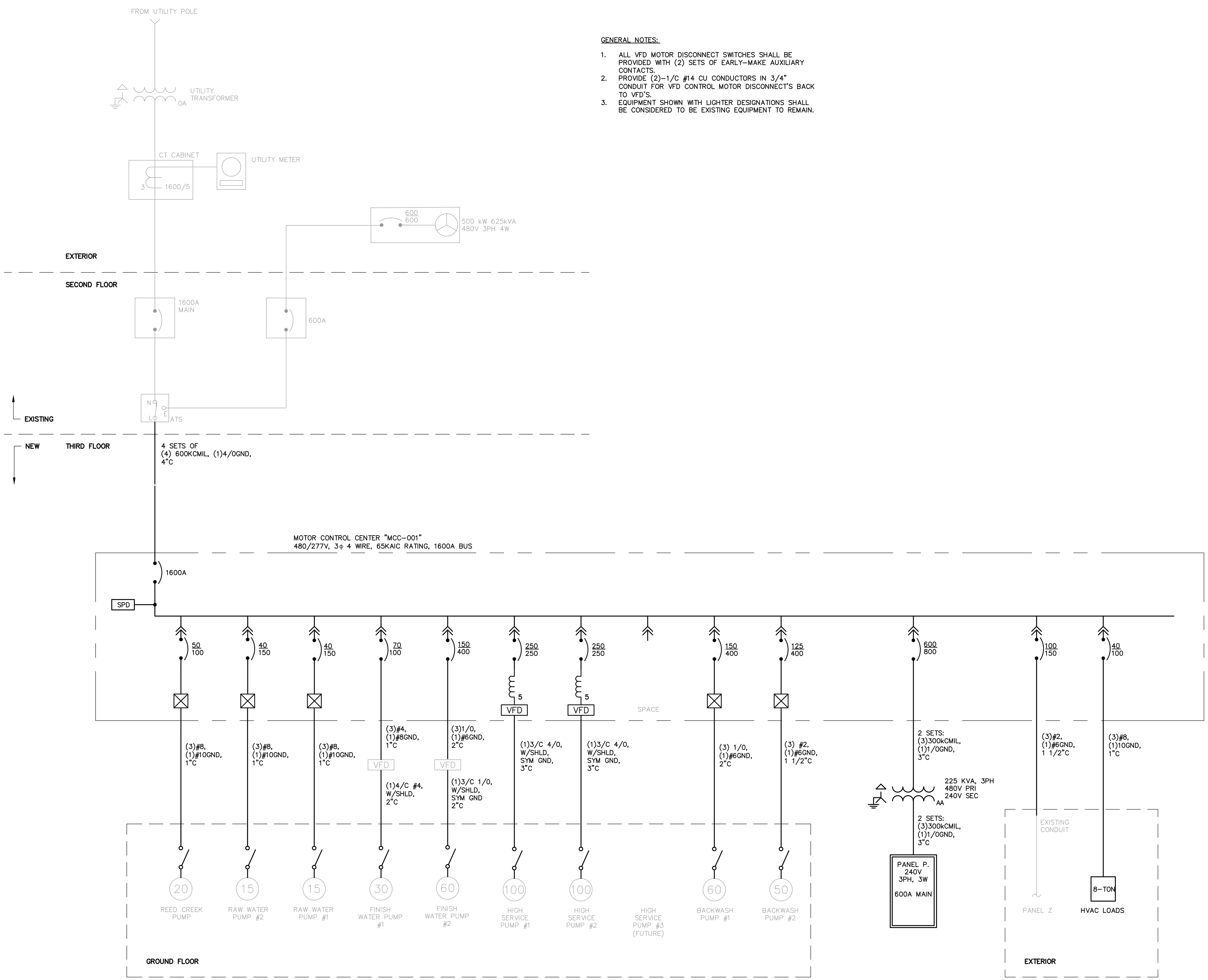
ELECTRICAL LEGEND

TOWN OF ALTAVISTA, VA
1200 LANE ACCESS RD.
ALTAVISTA, VA 24517

ELECTRICAL EVALUATION UPGRADE OPTIONS

JOB NO.: 229783.04
DATE: JULY 2016
SCALE: AS NOTED
SHEET: 1 OF 3

E00.01



GENERAL NOTES:

1. ALL VFD MOTOR DISCONNECT SWITCHES SHALL BE PROVIDED WITH (2) SETS OF EARLY-MAKE AUXILIARY CONTACTS.
2. PROVIDE (2)-1/C #14 CU CONDUCTORS IN 3/4" CONDUIT FOR VFD CONTROL MOTOR DISCONNECT'S BACK TO VFD'S.
3. EQUIPMENT SHOWN WITH LIGHTER DESIGNATIONS SHALL BE CONSIDERED TO BE EXISTING EQUIPMENT TO REMAIN.

PROPOSED CONCEPT. NOT FOR CONSTRUCTION

1:0.94614

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Portland, Maine 04102
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COMMITMENT & INTEGRITY DRIVE RESULTS

REV	DESCRIPTION	DATE

DESIGNED BY: PFH
CHECKED BY: PFH
DRAWN BY: NTHB

ONE LINE DIAGRAM

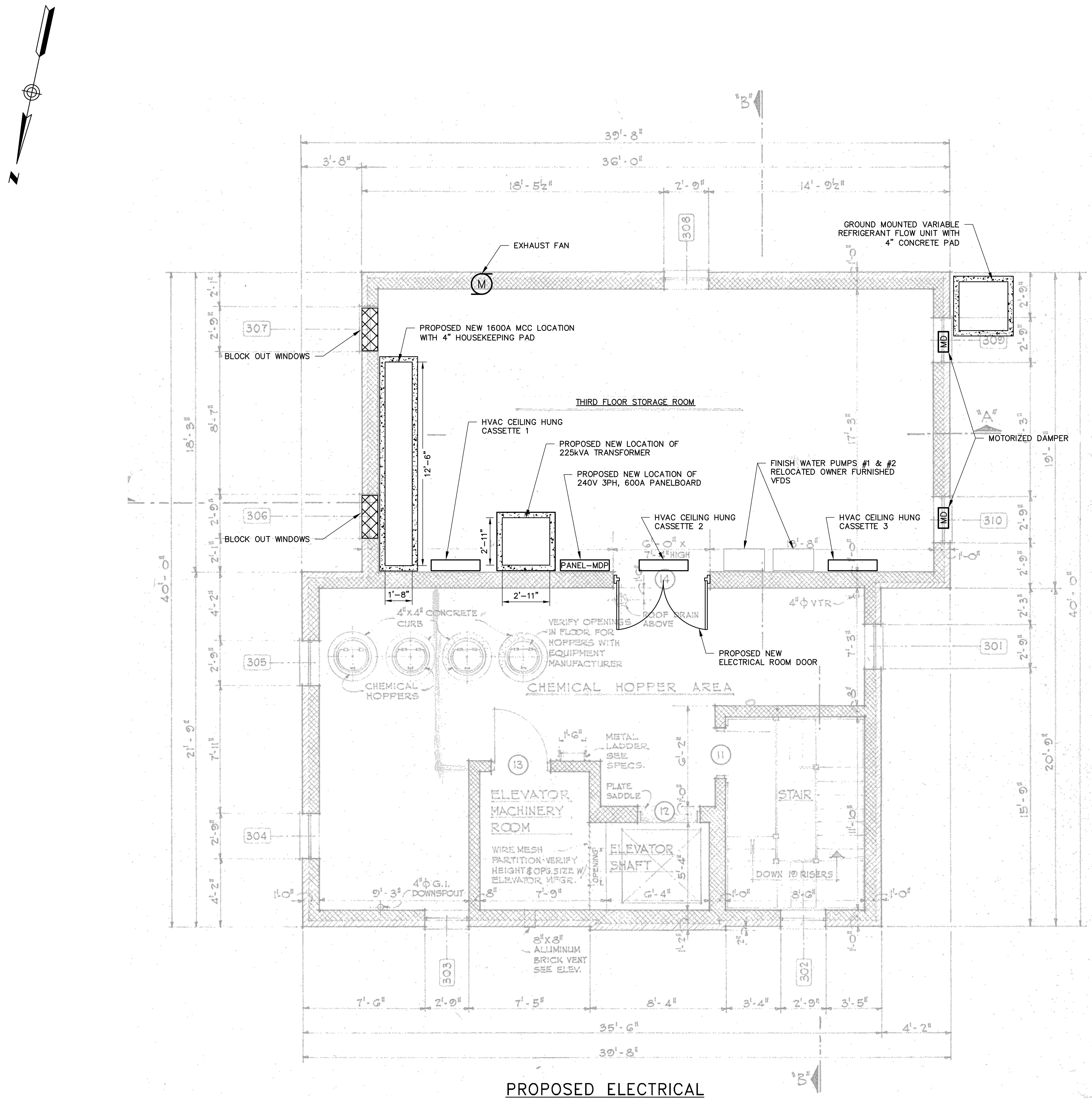
TOWN OF ALTAVISTA, VA
1200 LANE ACCESS RD,
ALTAVISTA, VA 24517

ELECTRICAL EVALUATION UPGRADE OPTIONS

JOB NO.: 229783.04
DATE: JULY 2016
SCALE: AS NOTED
SHEET: 3 OF 3

E10.01

1:0.94614



PROPOSED ELECTRICAL
LAYOUT
THIRD FLOOR

ELECTRICAL NOTES:

1. BUILDING REAR WINDOWS SHALL BE BLOCKED IN TO ALLOW INSTALLATION OF MCC
2. MINIMUM CLEARANCE OF 3'–6" INFRONT OF ALL ELECTRICAL EQUIPMENT
3. CONDUITS SHALL BOTTOM FEED FROM MCC AND ROUTE ALONG FILTER NO.1 CEILING.
4. INSTALLATION OF EQUIPMENT WILL REQUIRE REMOVAL OF WINDOW AND PARTIAL BLOCK WALL.

HVAC NOTES:

1. INSTALL VRF UNIT ON NEW GROUND MOUNTED EQUIPMENT PAD
2. RUN SUPPLY AND RETURN LINES TO CEILING OF THIRD FLOOR. EACH LINE TO ACT AS A HEADER WITH TAKEOFFS TO EACH CASSETTE
3. INSTALL (2) NEW LOUVERS WITH MOTOR OPERATED DAMPERS
4. INSTALL (1) EXHAUST FAN
5. INSTALL (3) CEILING MOUNTED CASSETTES

6' 4' 2' 0 4' 8'

BAR SCALE
1/4" = 1'-0"
CHECK GRAPHIC SCALE BEFORE USING

PROPOSED CONCEPT. NOT FOR CONSTRUCTION

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Portland, Maine 04102
800.426.4262 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

REV	DESCRIPTION	DATE

DESIGNED BY: PFH
CHECKED BY: AJF
DRAWN BY: NTHB

PROPOSED ELECTRICAL PLAN DRAWING

TOWN OF ALTAVISTA, VA
1200 LANE ACCESS RD,
ALTAVISTA, VA 24517

ELECTRICAL EVALUATION UPGRADE OPTIONS

JOB NO.: 229783.04
DATE: JULY 2016
SCALE: 1/4"=1'-0"
SHEET: 2 OF 3

E30.01

Attachment C: Preliminary Equipment Selection

REV	DESCRIPTION	BY	DATE	-	----	--	--/--/--	-	----	--	--/--/--
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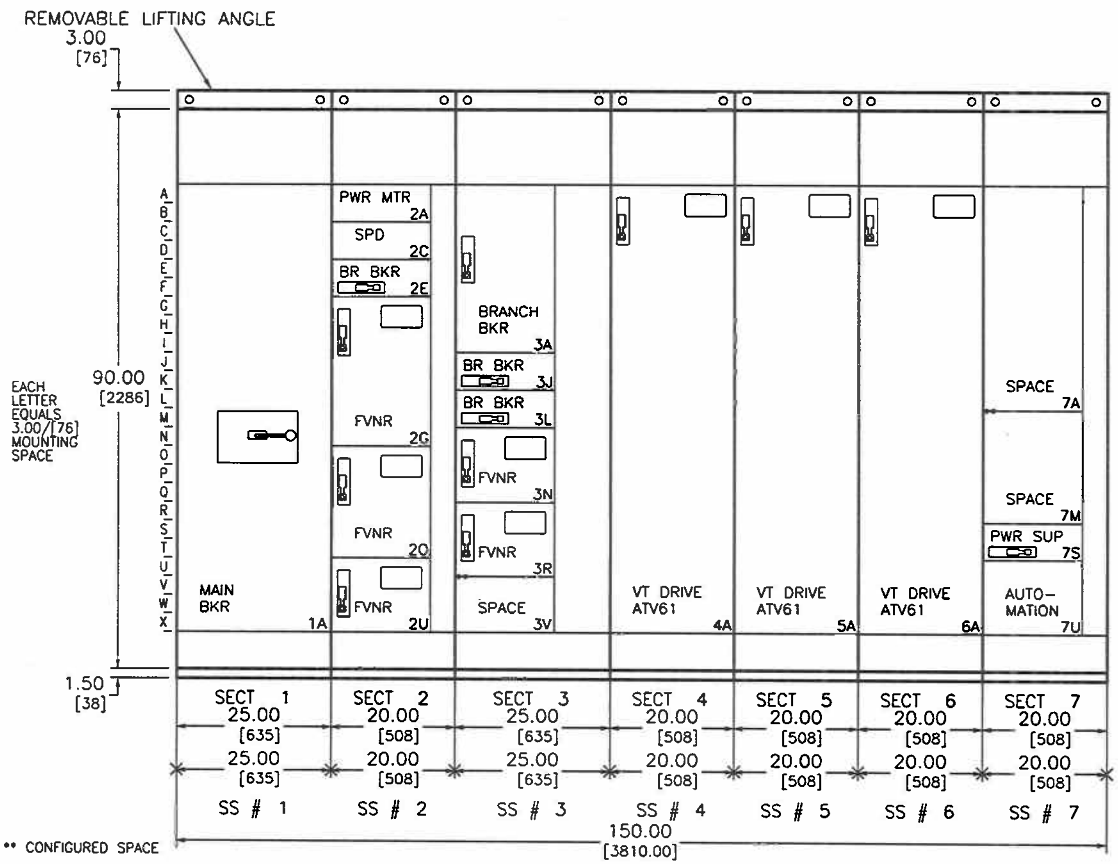

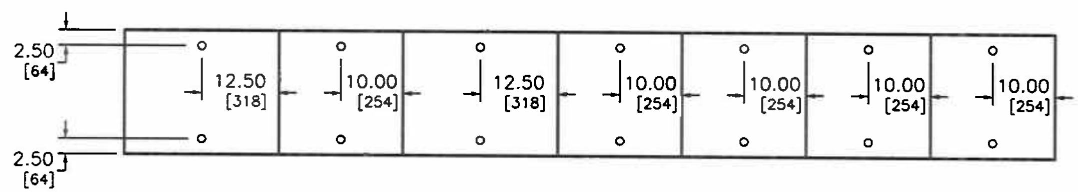

ANCHOR DETAIL

ENGLISH DIMENSIONS: INCHES

JOB NAME:	ALTAVISTA WTP – ALTAVISTA,VA – WOO	EQUIPMENT DESIGNATION:	MCC
JOB LOCATION:	Altavista,VA VA	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	(Q2C)	DRAWING TYPE:	ELEVATION
ENGR:			SQUARE D by Schneider Electric
DATE:	June 22 2016		
DRAWING STATUS:	QUOTE	DWG# F38395189-01	PG 1 OF 3 REV –

REV	DESCRIPTION	BY	DATE										
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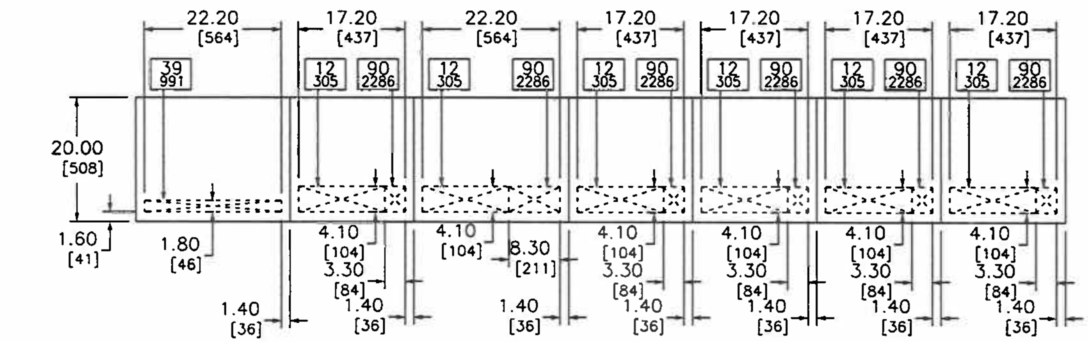
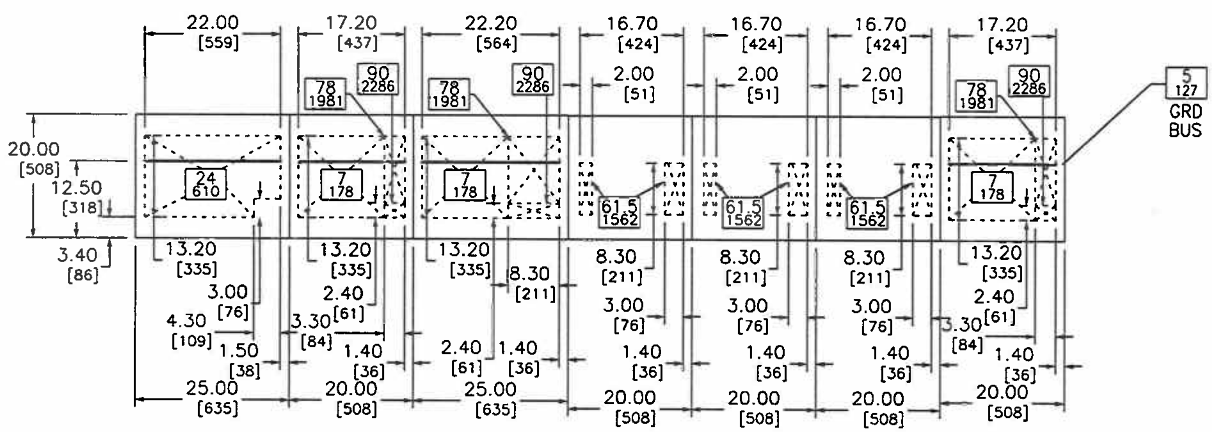


TOP VIEW



FLOOR VIEW

CROSSED AREA REPRESENTS CONDUIT ENTRY AREA. NUMBERS IN BOXES INDICATE VERTICAL CLEARANCE TO NEAREST OBSTRUCTION.

ENGLISH DIMENSIONS: INCHES

JOB NAME:	ALTAVISTA WTP - ALTAVISTA,VA - WOO	EQUIPMENT DESIGNATION: MCC	
JOB LOCATION:	Altavista,VA VA	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	(Q2C)	DRAWING TYPE:	ELEVATION
ENGR:		SQUARE D by Schneider Electric	
DATE:	June 22 2016		
DRAWING STATUS: QUOTE		DWG# F38395189-01	PG 2 OF 3 REV -

REV	DESCRIPTION	BY	DATE									
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GENERAL NOTES

iMCC-Network

PRODUCT DESCRIPTION AND RATINGS

POWER SYSTEM DATA:
480Y/277V 3PH 4W 60Hz
SHORT CIRCUIT RATING: 42kA
POWER ENTERS: Main Breaker Bottom Section 1
CONTROL POWER: 120Vac

BUS SYSTEM DATA:
MAIN HORIZONTAL BUS: 1600 Amp Copper/Tin Plated / 1.5"
BUS BRACING: 42kA
VERTICAL BUS: 300 Amp Tin Plated Copper
NEUTRAL BUS: 1200 Amp Tin Plated Copper
HORIZONTAL GROUND BUS: .25" X 1.0" (6.35mm X 25.4mm) Tin Plated Copper
Units Securely Grounded To Structure

ENCLOSURE DATA:
ENCLOSURE TYPE: 20" DEEP Type 1
EXTERIOR COLOR: Electrodeposition Finish ANSI 49 Medium Light Grey
INTERIOR COLOR: Electrodeposition Finish White
REMOVABLE 3" [76mm] LIFTING ANGLE

STRUCTURE MODIFICATIONS:
Ground Bus Lug : Main Section
Rodent Barriers 1,7
Manual Bus Shutters 2,3,7
Fishtape Barriers 2,3,7
Communication Barriers 2,3,7
Main Section Partition 1
Copper Vertical Ground Bus 2,3,7
Neutral Bus Drop 2,3,7

EQUIPMENT WEIGHT:
SHIPPING SPLIT # 1: 720.00 Lbs. (326.59 Kg.)
SHIPPING SPLIT # 2: 750.00 Lbs. (340.20 Kg.)
SHIPPING SPLIT # 3: 770.00 Lbs. (349.27 Kg.)
SHIPPING SPLIT # 4: 700.00 Lbs. (317.52 Kg.)
SHIPPING SPLIT # 5: 700.00 Lbs. (317.52 Kg.)
SHIPPING SPLIT # 6: 700.00 Lbs. (317.52 Kg.)
SHIPPING SPLIT # 7: 750.00 Lbs. (340.20 Kg.)
TOTAL LINEUP WEIGHT (APPROX): 5090.00 Lbs. (2308.82 Kg.)

PRODUCT ACCESSORIES:
TeSys T Handheld Display
Ethernet (Modbus TCP) iMCC Network

JOB NAME:	ALTAVISTA WTP - ALTAVISTA,VA - WOO	EQUIPMENT DESIGNATION:	MCC
JOB LOCATION:	Altavista,VA VA	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	(Q2C)	DRAWING TYPE:	ELEVATION
ENGR:			SQUARE D by Schneider Electric
DATE:	June 22 2016		
DRAWING STATUS:	QUOTE	DWG# F38395189-01	PG 3 OF 3 REV -

REV	DESCRIPTION	BY	DATE								
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UNIT LOC	NAMEPLATE DESIGNATION (GRAY SURFACE/WHITE LETTERS)	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: 22 mm •• ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
1A		MAIN BKR			RK 3000	1600											1/0-750KCMIL 6 LUGS/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE, ELECTRONIC POWER TRIP UNIT, LSIG TRIP FUNCTION, SOLID NEUTRAL	E38395189--01
2A	MONITORING UNIT FOR MAIN	POWER METER															ETHERNET COMM, PM8244 W/DISPLAY	E38395189--01
2C	SURGE PROTECTION DEVICE	SPD	240kA		SW 30												SOLIDLY GROUNDED, SURGE COUNTER	E38395189--02
2E	Panel 2	6" BRANCH BKR			HJ 150	100											14-3/0AWG 1 LUG/PH, 80% RATED, AL MECH LUG AL/CU CABLE	E38395189--03
2G	50 hp	FVNR	NEMA 4	60	HJ 150	ADJ 150	CONTROL TRANSFORMER	500	2.80	5.00	1	1	RED PTT	GREEN PTT		HOA SS	#16 AWG MTW CONTROL WIRE, CNTRL TRANSFORMER TAPS, ETHERNET, ETM, MOTOR CIRCUIT PROTECTOR, RESET PB, Tesys T OL, TRANSIENT SUPPRESSION, WIRED RELAY, WIRED RELAY	E38395189--04
2O	50 hp	FVNR	NEMA 3	50	HJ 150	ADJ 100	CONTROL TRANSFORMER	300	1.60	3.20	1	1	RED PTT	GREEN PTT		HOA SS	#16 AWG MTW CONTROL WIRE, CNTRL TRANSFORMER TAPS, ETHERNET, ETM, MOTOR CIRCUIT PROTECTOR, RESET PB, Tesys T OL, TRANSIENT SUPPRESSION, WIRED RELAY, WIRED RELAY	E38395189--05
2U	Raw Water Pump #1	FVNR	NEMA 2	15	HJ 150	ADJ 50	CONTROL TRANSFORMER	150	1.00	1.60	1	1	RED PTT	GREEN PTT		HOA SS	#16 AWG MTW CONTROL WIRE, CNTRL TRANSFORMER TAPS, ETHERNET, ETM, MOTOR CIRCUIT PROTECTOR, RESET PB, Tesys T OL, TRANSIENT SUPPRESSION, WIRED RELAY, WIRED RELAY	E38395189--06
UNIT LOC	NAMEPLATE DESIGNATION	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI FUSE SIZE	SEC	NO INTERLOCKS	NC	ON LIGHT PILOT DEVICES: 22 mm ••	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #

JOB NAME: ALTAVISTA WTP - ALTAVISTA,VA - WOO
JOB LOCATION: Altavista,VA VA
DRAWN BY: (Q2C)
ENGR:
DATE: June 22 2016
DRAWING STATUS: QUOTE

EQUIPMENT DESIGNATION: MCC
EQUIPMENT TYPE: MODEL 6 MOTOR CONTROL CENTER
DRAWING TYPE: UNIT INFORMATION

by Schneider Electric

DWG# 138395189-01 PG 1 OF 3 REV -

REV	DESCRIPTION	BY	DATE
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UNIT LOC	NAMEPLATE DESIGNATION	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: ON LIGHT	22 mm •• OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
3A	240V XFMR	BRANCH BKR			LJ 600	600											(2)2/0-500KCMIL 1 LUGS/PH, 24VDC TRIP UNIT PWR SUPP, 80% RATED, AL MECH LUG AL/CU CABLE, ELECTRONIC AMMETER TRIP UNIT, LSIG TRIP FUNCTION, SOLID NEUTRAL	E38395189--07
3J	Panel Z	6" BRANCH BKR			JJ 250	175											4-4/0 AWG 1 LUG/PH, 80% RATED, AL MECH LUG AL/CU CABLE	E38395189--08
3L	Panel Z	6" BRANCH BKR			HJ 150	100											14-3/0AWG 1 LUG/PH, 80% RATED, AL MECH LUG AL/CU CABLE	E38395189--03
3N	Raw Water Pump #2	FVNR	NEMA 2	15	HJ 150	ADJ 50	CONTROL TRANSFORMER	150	1.00	1.60	1	1	RED PTT	GREEN PTT		HOA SS	#16 AWG MTW CONTROL WIRE, CNTRL TRANSFORMER TAPS, ETHERNET, ETM, MOTOR CIRCUIT PROTECTOR, RESET PB, Tesys T OL, TRANSIENT SUPPRESSION, WIRED RELAY, WIRED RELAY	E38395189--06
3R	Reed Creek Pump	FVNR	NEMA 2	15	HJ 150	ADJ 50	CONTROL TRANSFORMER	150	1.00	1.60	1	1	RED PTT	GREEN PTT		HOA SS	#16 AWG MTW CONTROL WIRE, CNTRL TRANSFORMER TAPS, ETHERNET, ETM, MOTOR CIRCUIT PROTECTOR, RESET PB, Tesys T OL, TRANSIENT SUPPRESSION, WIRED RELAY, WIRED RELAY	E38395189--06
3V		SPACE																
4A	Hig Service Pump #1	VT DRIVE ATV61	D55	100	JL 250	250	CONTROL TRANSFORMER	300	1.60	3.20			RED PTT	GREEN PTT	YEL FAULT PTT YEL HAND AUTO	HOA SS SPD POT	#16 AWG MTW CONTROL WIRE, ETHERNET TCP COMM, EXTENDED I/O	E38395189--09
5A	Hig Service Pump #2	VT DRIVE ATV61	D55	100	JL 250	250	CONTROL TRANSFORMER	300	1.60	3.20			RED PTT	GREEN PTT	YEL FAULT PTT YEL HAND AUTO	HOA SS SPD POT	#16 AWG MTW CONTROL WIRE, ETHERNET TCP COMM, EXTENDED I/O	E38395189--09
UNIT LOC	NAMEPLATE DESIGNATION	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI FUSE SIZE	SEC	NO INTERLOCKS	NC	ON LIGHT PILOT DEVICES:	OFF LIGHT 22 mm ••	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #

JOB NAME: ALTAVISTA WTP - ALTAVISTA,VA - WOO
JOB LOCATION: Altavista,VA VA
DRAWN BY: (O2C)
ENGR:
DATE: June 22 2016
DRAWING STATUS: QUOTE

EQUIPMENT DESIGNATION: MCC
EQUIPMENT TYPE: MODEL 6 MOTOR CONTROL CENTER
DRAWING TYPE: UNIT INFORMATION

SQUARE D by Schneider Electric

DWG# 138395189-01

REV	DESCRIPTION	BY	DATE
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UNIT LOC	NAMEPLATE DESIGNATION	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	FUSE SIZE PRI	FUSE SIZE SEC	INTERLOCKS NO	INTERLOCKS NC	PILOT DEVICES: 22 mm •• ON LIGHT	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #
6A	Hig Service Pump (future)	VT DRIVE ATV61	D55	100	JL 250	250	CONTROL TRANSFORMER	300	1.60	3.20			RED PTT	GREEN PTT	YEL FAULT PTT YEL HAND AUTO	HOA SS SPD POT	#16 AWG MTW CONTROL WIRE, ETHERNET TCP COMM, EXTENDED I/O	E38395189--09
7A		SPACE																
7M		SPACE																
7S	8A/24Vdc POWER SUPPLY FOR Ethernet Switch	POWER SUPPLY															#16 AWG MTW CONTROL WIRE	E38395189--10
7U	Ethernet Switch	AUTO-MATION															12TX / 2FX, Managed Ethernet Switch Unit	E38395189--11
UNIT LOC	NAMEPLATE DESIGNATION	UNIT TYPE	SIZE	HP	FRAME AMPS	TRIP AMPS	CONTROL SOURCE	VA	PRI FUSE SIZE	SEC	NO INTERLOCKS	NC	ON LIGHT PILOT DEVICES: 22 mm ••	OFF LIGHT	ADDL P/L	SS / PB	OTHER UNIT FEATURES	ELEMENTARY #

JOB NAME:	ALTAVISTA WTP - ALTAVISTA,VA - WOO
JOB LOCATION:	Altavista,VA VA
DRAWN BY:	(Q2C)
ENGR:	
DATE:	June 22 2016
DRAWING STATUS:	QUOTE

EQUIPMENT DESIGNATION:	MCC
EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWING TYPE:	UNIT INFORMATION

SQUARE D by Schneider Electric

DWG# 138395189-01 PG 3 OF 3 REV -

REV	DESCRIPTION	BY	DATE										
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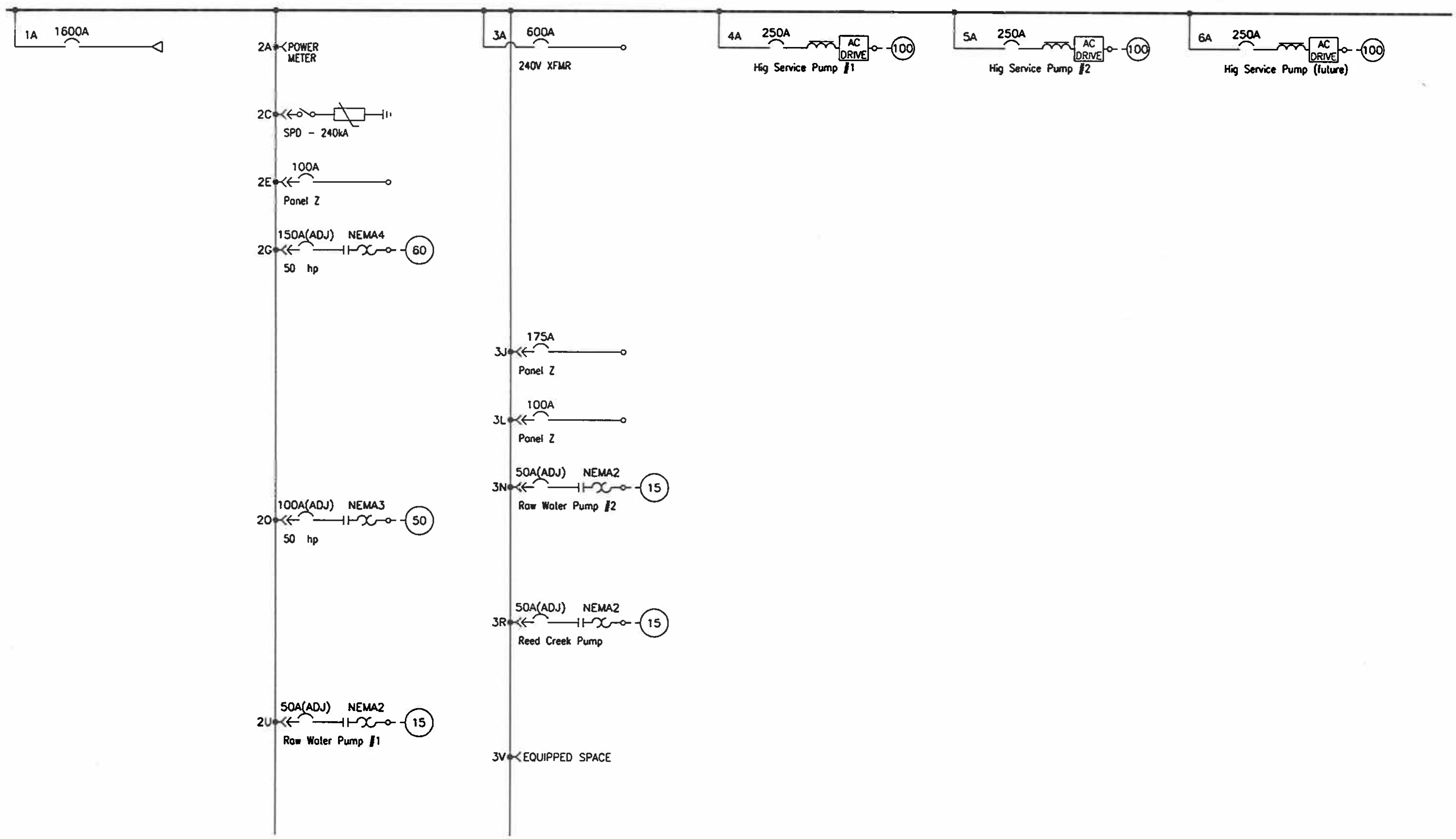

JOB NAME:	ALTAVISTA WTP - ALTAVISTA,VA - WOO	EQUIPMENT DESIGNATION:	MCC
JOB LOCATION:	Altavista,VA VA	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	(Q2C)	DRAWING TYPE:	ONE LINE DIAGRAM
ENGR:			
DATE:	June 22 2016		
DRAWING STATUS:	QUOTE	DWG# 038395189-01	PG 1 OF 2 REV -

REV	DESCRIPTION	BY	DATE								
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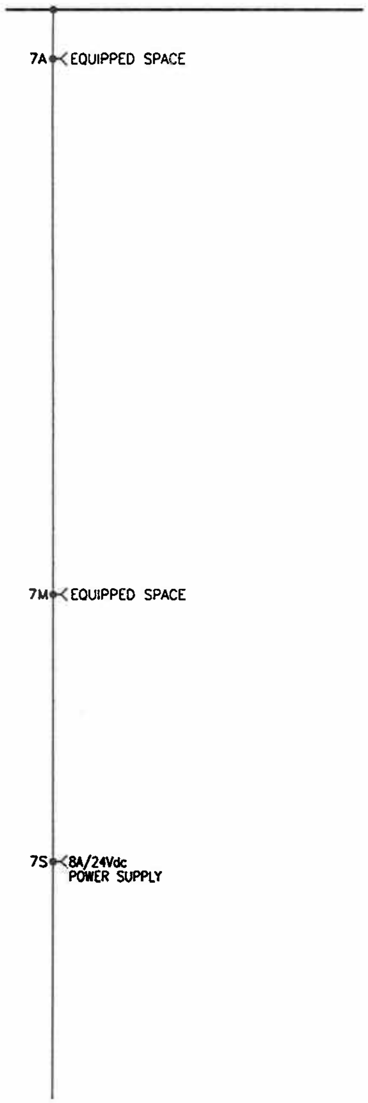
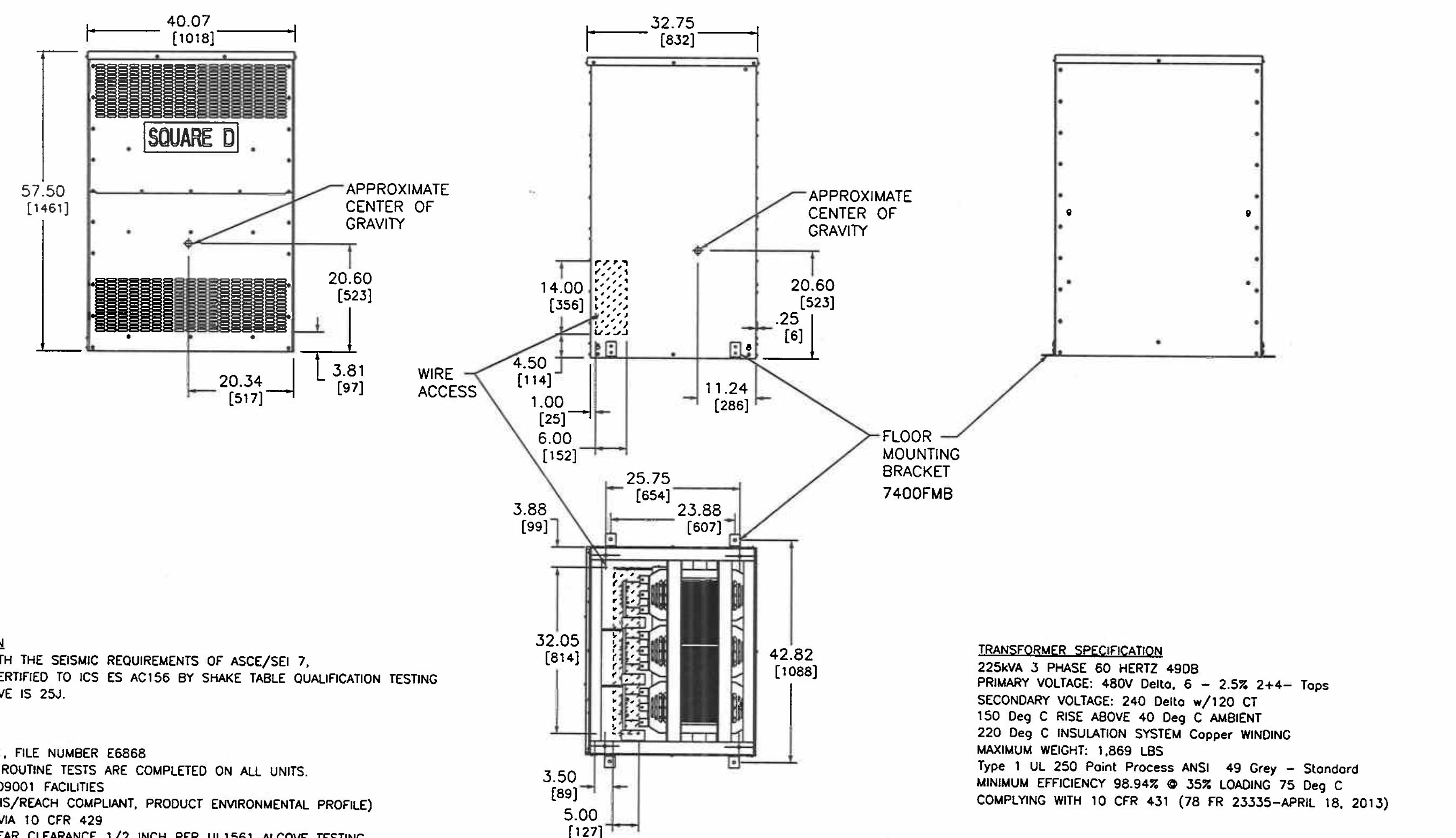


JOB NAME:	ALTAVISTA WTP - ALTAVISTA,VA - WOO	EQUIPMENT DESIGNATION:	MCC
JOB LOCATION:	Altavista,VA VA	EQUIPMENT TYPE:	MODEL 6 MOTOR CONTROL CENTER
DRAWN BY:	(O2C)	DRAWING TYPE:	ONE LINE DIAGRAM
ENGR:			by Schneider Electric
DATE:	June 22 2016		
DRAWING STATUS:	QUOTE	DWG# 038395189-01	PG 2 OF 2 REV -

REV	DESCRIPTION	BY	DATE								
-	----	--	--/--/--	-	----	--	--/--/--	-	----	--	--/--/--
				-	----	--	--/--/--	-	----	--	--/--/--



SEISMIC QUALIFICATION
TO BE COMPLIANT WITH THE SEISMIC REQUIREMENTS OF ASCE/SEI 7,
THIS UNIT IS SELF CERTIFIED TO ICS ES AC156 BY SHAKE TABLE QUALIFICATION TESTING
THE ENCLOSURE ABOVE IS 25J.

NOTES:
UL LISTED TO UL1561, FILE NUMBER E6868
NEMA ST-20 (2014) ROUTINE TESTS ARE COMPLETED ON ALL UNITS.
MANUFACTURED IN ISO9001 FACILITIES
GREEN PREMIUM (RoHS/REACH COMPLIANT, PRODUCT ENVIRONMENTAL PROFILE)
REGISTERED TO DOE VIA 10 CFR 429
MINIMUM SIDE AND REAR CLEARANCE 1/2 INCH PER UL1561 ALCOVE TESTING.
FRONT ACCESS MUST COMPLY WITH NEC WORK SPACE REQUIREMENTS.
WIRE ACCESS SHOWN SHADED ABOVE. LOCATIONS ARE FRONT SIDES AND FRONT BOTTOM.

TRANSFORMER SPECIFICATION
225kVA 3 PHASE 60 HERTZ 49DB
PRIMARY VOLTAGE: 480V Delta, 6 - 2.5% 2+4- Taps
SECONDARY VOLTAGE: 240 Delta w/120 CT
150 Deg C RISE ABOVE 40 Deg C AMBIENT
220 Deg C INSULATION SYSTEM Copper WINDING
MAXIMUM WEIGHT: 1,869 LBS
Type 1 UL 250 Paint Process ANSI 49 Grey - Standard
MINIMUM EFFICIENCY 98.94% @ 35% LOADING 75 Deg C
COMPLYING WITH 10 CFR 431 (78 FR 23335-APRIL 18, 2013)

ENGLISH DIMENSIONS: INCHES

EX225T6HCUCT

JOB NAME:	ALTAVISTA WTP - ALTAVISTA,VA - WOO	EQUIPMENT DESIGNATION:	XFMR
JOB LOCATION:	Altavista,VA VA	EQUIPMENT TYPE:	LV DISTRIBUTION TRANSFORMER
DRAWN BY:	(Q2C)	DRAWING TYPE:	ELEVATION VIEW
ENGR:			
DATE:	June 22 2016		by Schneider Electric
DRAWING STATUS: QUOTE	NOT FOR CONSTRUCTION	DWG# F38395189-01	PG 1 OF 1 REV -

I-Line®
Circuit Breaker Panelboards

Catalog

05

Class 2110

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Accessories	8
General and Application Information	9
Dimensions	14
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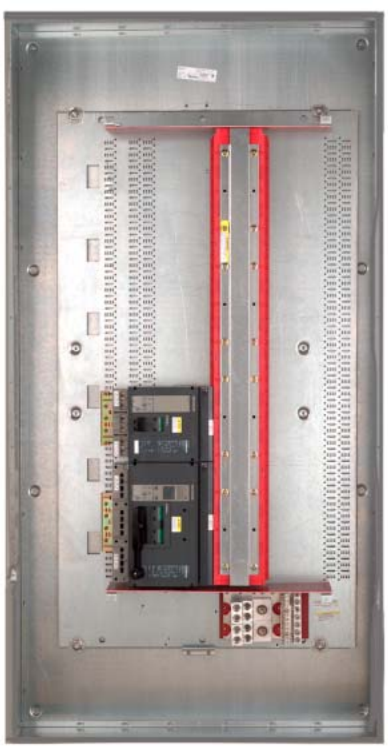
a brand of Schneider Electric

SQUARE D

Type HCR-U—1200 A Main Circuit Beaker



Type HCR-U—1200 A Main Circuit Beaker

PRODUCT DESCRIPTION

Square D®-brand I-Line® circuit breaker power distribution panelboards are for use on AC or DC systems. The panels, labeled cULus (compliance to UL and CSA standards certified by UL) are also Underwriters Laboratories® (UL®) Listed under File E33139. The following are suitable for use as service entrance equipment:

- All main circuit breaker panelboards.
- All main lugs panelboards with branch-mounted, back-fed main circuit breaker. (For Canadian MLO service entrance, use HCP-SU and HCR-U only).
- All main lugs panelboards with six disconnects or less.
- A solid neutral that is insulated, but may be bonded to the box with a grounding strap.
- Service entrance panelboards meeting the requirements of CSA are available in Canada factory-assembled only.

I-Line circuit breaker panelboards are available as 225–1200 A main lugs only and 100–1200 A main circuit breakers. I-Line panelboards are designed to accept the following circuit breakers: FY, FA, FH, FC, FJ, FK, FI, HD, HG, HJ, HL, QB, QD, QG, QJ, QO, KA, KH, KC, KI, JD, JG, JJ, JL, LA, LH, LC, LI, LE, LX, LXI, MA, MH, MG, MJ, PG, PJ, PK*, PL, RG, RJ, RK*, and RL.

* *Canada only.*

Standards

I-Line circuit breaker panelboards are designed, manufactured, and tested to comply with the following standards:

Standard	Description
UL 50	Standard for enclosures for electrical equipment
UL 67	Standard for panelboards
CSA C22.2, Nos. 29 and 94—1989	Standard for panelboards and enclosed panelboards
NFPA 70	National Electrical Code (NEC)
NEMA PB 1	Standard for panelboards
W–P 115C Type 1 Class 1	Specification for circuit breaker panelboards
2000 IBC	US standard for seismic requirements
1995 NBCC	Canadian standard for seismic requirements

Service

I-Line circuit breaker panelboards can be used on the following system voltages:

- 120/240 VAC; 1-phase, 3-wire
- 240 VAC; 1-phase, 2-wire
- 240 VAC; 3-phase, 3-wire
- 240 VAC Ground, B-phase; 3-phase, 3-wire
- 208Y/120 VAC; 3-phase, 4-wire
- 480Y/277 VAC; 3-phase, 4-wire
- 480 VAC; 3-phase, 3-wire
- 600Y/347 VAC; 3-phase, 4-wire
- 600 VAC; 3-phase, 3-wire
- 125/250 VDC; 3-wire
- 250 VDC; 2-wire

I-Line® Circuit Breaker Panelboards
Product Description

Type HCP—600 A Main Circuit Breaker

Panelboard Types

Panelboard Type	Maximum Mains Ampacity		Maximum Branch Circuit Breaker Frame Size ❖		Enclosure Dimensions ■	
	Main Lugs	Main Circuit Breakers	Left	Right	Width IN (mm)	Depth IN (mm)
HCN	600 A	400 A	FA, QB, HD	FA, QB, HD	26 (660)	6.50 (165)
HCM	800 A	800 A	JD	JD	32 (813)	8.25 (210)/ 9.50 (241)
HCP-SU	800 A	800 A ◆	MG, PG	None	26 (600)	9.50 (241)
HCP	1200 A	800 A ◆	MG, PG	JD	42 (1067)	9.50 (241)
HCR-U	1200 A	1200 A ◆	RG	JD	44 (1118)	9.50 (241)

❖ For a complete listing of applicable circuit breaker types, refer to the dimensions section.
■ Refer to the Dimensions section for standard panelboard heights.
◆ Available as a main circuit breaker panelboard when provided with a branch mounted back-fed main circuit breaker.

Type HCP-SU
800 A Main Circuit Beaker

Type HCM—400 A Main Lugs

Types 1 and 2 Enclosure with Optional Door

Flush Lock used on HCN, HCM, and HCP-SU Types 1 and 2 Fronts (Catalog No. PK4FL)

Sliding Vault Lock used on HCN, HCP, and HCR-U Types 1 and 2 Fronts (Catalog No. PK5FL)

Enclosure Types

Types	Environments	Provides Protection Against
Type 1	Indoor	Contact with the enclosed equipment
Type 2	Indoor	Falling water and dirt
Type 3R	Outdoor	Falling rain, sleet; undamaged by ice
Type 4/4X Stainless	Indoor/Outdoor	Corrosion, hose-directed water, dust
Type 5	Indoor	Settling dust, falling dirt, dripping liquids
Type 12	Indoor	Circulating dust, falling dirt, dripping liquids

<table>
<tr><td rowspan="5">Type 1 Enclosures</td><td rowspan="3">Fronts:</td><td>HCN, HCM, HCP, HCP-SU, and HCR-U surface and flush trims available as four-piece construction, standard (door not included). An optional four-piece trim with door is also available.</td></tr>
<tr><td>Finished with gray-baked enamel electrodeposited over cleaned phosphatized steel (ANSI 49).</td></tr>
<tr><td>Directory card holders provided with all fronts.</td></tr>
<tr><td rowspan="2">Boxes:</td><td>Galvanized steel in 26, 32, 42, and 44-inch (660, 813, 1067, and 1118 mm) widths.</td></tr>
<tr><td>Removable endwalls without knockouts.</td></tr>
<tr><td rowspan="6">Type 3R, 5, and 12 Enclosures</td><td colspan="2">Gasketed door with vault handle and directory card holder.</td></tr>
<tr><td colspan="2">Three-point latching.</td></tr>
<tr><td colspan="2">End and side gutter trim.</td></tr>
<tr><td colspan="2">No knockouts.</td></tr>
<tr><td colspan="2">Removable drain screw for Type 3R.</td></tr>
<tr><td colspan="2">Finished with gray-baked enamel electrodeposited over cleaned phosphatized steel (ANSI 49).</td></tr>
<tr><td rowspan="4">Type 4X Enclosures (Factory-Assembled Only)</td><td colspan="2">Corrosion-resistant, fiberglass-reinforced polyester.</td></tr>
<tr><td colspan="2">Watertight and dusttight.</td></tr>
<tr><td colspan="2">Gasketed door with trunk latches.</td></tr>
<tr><td colspan="2">Directory card located on inside of door.</td></tr>
</table>

Type 3R, 5, and 12 Enclosures

Type 3R, 5, and 12 Enclosures

Vault Handle used on all Type 3R, 5, and 12 Enclosures (Catalog No. PK4NVL)

I-Line® Circuit Breaker Panelboards
Product Description

Main Circuit Breaker and Solid Neutral Compartment (Canada service entrance not shown)

Main Breaker Panelboards

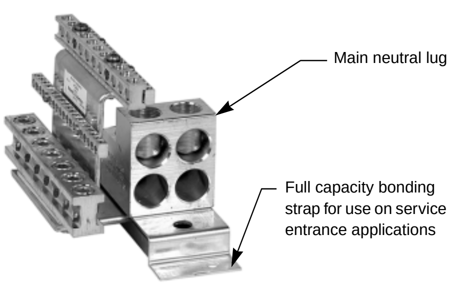
- Accept a maximum 1200 A, 80% or 100% rated main breaker.
- Available factory-assembled or merchandised.*
- Factory-assembled main circuit breaker interiors are available bottom-feed or top-feed.
- Suitable for use as service entrance equipment, US and Canada.
- Accept plug-on I-Line circuit breakers.
- Available with a short circuit current rating (SCCR) up to 200 kA maximum (100 kA @ 600 VAC) when supplied by an I-Limiter® circuit breaker.
- Available with a silver-plated or tin-plated copper bus, or tin-plated aluminum bus.
- Solid neutral is mounted in the mains compartment with the main circuit breaker.
- Merchandised (RTA in Canada) main circuit breaker panelboards are provided bottom-feed as standard.

* Ready-to-Assemble (RTA) in Canada

Main Lug and Solid Neutral Compartment

Main Lugs Only Panelboards

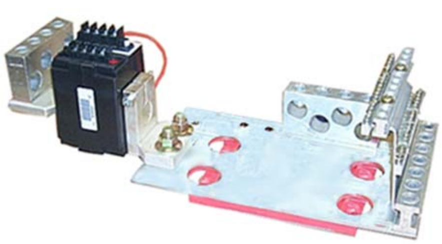
- Available with main lug only interiors rated up to 1200 A.
- Available factory-assembled or merchandised (RTA in Canada).
- Suitable for use as service entrance equipment when provided with a main circuit breaker, US and Canada.
- Accept plug-on I-Line circuit breakers.
- Available with a short circuit current rating (SCCR) up to 200 kA maximum (100 kA @ 600 VAC) when supplied by an I-Limiter circuit breaker.
- Available with a silver-plated or tin-plated copper bus, or tin-plated aluminum bus.
- Solid neutral is mounted in the mains compartment with the main lugs.
- Hinged cover, isolated main lugs compartment.
- Main lug interiors are available as top-feed or bottom-feed.



Typical Solid Neutral

Solid Neutral

- Mounts in main lug or main circuit breaker compartment.
- Does not take up interior circuit breaker mounting space.
- UL/CSA Listed for use with Al or Cu conductors.
- Copper or aluminum neutral available.
- 200% rated neutral available as a factory-assembled option.



Neutral with C/T for Use on HCR-U When Ground-Fault Protection is Required (Catalog No. HCR12SNCT)

Circuit Breaker Types

FY
1-Pole; 15–30 A

FA, FH
1-, 2-, and 3-Pole; 15–100 A

FI
2- and 3-Pole; 20–100 A

QB, QD, QG, QJ
2- and 3-Pole; 70–225 A

HD, HG, HJ, HL
2- and 3-Pole; 15–150 A

JD, JG, JJ, JL
2- and 3-Pole; 150–250 A

KI
2- and 3-Pole; 110–250 A

LC, LI
2- and 3-Pole; 300–600 A

LE, LX
2- and 3-Pole; 100–600 A

MG, MJ
2- and 3-Pole; 300–800 A

PG, PJ, PK, PL
2- and 3-Pole; 250–1200 A

RG, RJ, RK, RL
2- and 3-Pole; 1000–1200 A

Outdoor Unit 460V HP | 6-10 TON SYSTEMS

6-10 Ton Systems	Type				Single Unit Systems					
	Tonnage				6 Ton		8 Ton		10 Ton	
Model					YVAHP072B41S		YVAHP096B41S		YVAHP120B41S	
Power Supply					460V/ 3PH 60Hz		460V/ 3PH 60Hz		460V/ 3PH 60Hz	
Capacity (Nominal)	Cooling	Capacity (Nominal)	Btu/h	(kW)	72,000	(21.1)	96,000	(28.1)	120,000	(35.2)
		Power input	kW		6.08		7.61		10.57	
		Current input	A		8.5		10.6		15.8	
	Heating	Capacity (Nominal)	Btu/Wh	(W/W)	81,000	(23.7)	108,000	(31.7)	135,000	(39.6)
		Power input	kW		5.93		7.33		9.73	
		Current input	A		8.3		11.1		14.4	
Efficiency Ratings *	Cooling	Capacity (Rated)	Btu/h	(kW)	69,000	(20.2)	92,000	(27.0)	114,000	(33.4)
		EER	Btu/Wh	(W/W)	15.30	(4.49)	13.10	(3.84)	11.20	(3.29)
		IEER	Btu/Wh	(Wh/Wh)	24.80	(7.27)	21.40	(6.28)	19.80	(5.81)
	Heating High	Capacity (Rated)	Btu/h	(kW)	76,000	(22.3)	103,000	(30.2)	129,000	(37.8)
		COP	W/W		4.14		3.88		3.66	
	Heating Low	Capacity	Btu/h	(kW)	55,000	(16.1)	76,000	(22.3)	89,000	(26.1)
		COP	W/W		2.48		2.31		2.25	
Cooling Operating Range**		Indoor	°F WB (°C WB)		59(15) ~ 73(23)		59(15) ~ 73(23)		59(15) ~ 73(23)	
		Outdoor	°F DB (°C DB)		14(-10) ~ 118(48)		14(-10) ~ 118(48)		14(-10) ~ 118(48)	
Heating Operating Range**		Indoor	°F DB (°C DB)		59(15) ~ 80(27)		59(15) ~ 80(27)		59(15) ~ 80(27)	
		Outdoor	°F WB (°C WB)		-4(-20) ~ 59(15)		-4(-20) ~ 59(15)		-4(-20) ~ 59(15)	
Cabinet Color (Munsell Code)			-				2.5Y 8/2			
Outer Dimensions	Height		in	(mm)	68-1/8	(1730)	68-1/8	(1730)	68-1/8	(1730)
	Width		in	(mm)	37-7/8	(962)	48-1/8	(1222)	48-1/8	(1222)
	Depth		in	(mm)	31-7/32	(793)	31-7/32	(793)	31-7/32	(793)
Package Dimensions	Height		in	(mm)	74-1/4	(1886)	74-1/4	(1886)	74-1/4	(1886)
	Width		in	(mm)	40-5/8	(1032)	50-7/8	(1292)	50-7/8	(1292)
	Depth		in	(mm)	34-1/32	(864)	34-1/32	(864)	34-1/32	(864)
Weight	Net		lbs	(kg)	606	(275)	796	(361)	798	(362)
	Gross		lbs	(kg)	653	(296)	853	(387)	856	(388)
Connection Ratio	Total Indoor Unit Capacity		%		150 - 70		135 - 65		130 - 60	
	Max. (Recommendation) indoor units/system				18 (10)		21 (16)		25 (16)	
Heat Exchanger	Type		-				Multi-Pass Cross-Finned Tube			
	Material		-				Cu-Al (Anti-corrosion)			
Compressor	Type		Inverter		DA65PHD×1		DA65PHD×1		DA65PHD×1	
			Fix Speed		-		E655DH×1		E655DH×1	
	Motor Output (Pole)		kW (Pole)		7.2 (6)		4.8 (6)+4.4 (2)		6.0 (6)+4.4 (2)	
	Start Method		-				inverter			
	Operation Range		%		20~100		16~100		15~100	
	Refrigeration Oil Type		-		FVC68D		FVC68D		FVC68D	
Crank Case Heater			W×Q'ty		40.8 (230V)×2		40.8 (230V)×4		40.8 (230V)×4	
Fan	Type		-		Propeller Fan		Propeller Fan		Propeller Fan	
	Motor Output (Pole)		kW (Pole)		0.49(8)		0.66(8)		0.91(8)	
	Quantity		Q'ty				1			
	Air Flow Rate		cfm	(m^3/min)	6178	(175)	6884	(195)	7413	(210)
	External static pressure***		in.WG	(Pa)			0 (0)			
	Drive		-				Direct drive			
Electrical	Min Circuit Amps		A		24		28		34	
	Recommended Fuse/Breaker Size		A				40			
	Maximum Fuse Size		A				40			
Sound Pressure Level *6	Cooling (Night-Shift)		dB(A)		60	(55)	62	(57)	64	(57)
	Heating		dB(A)		60		62		64	
Protection devices	Cycle		-				High pressure switch at 601psi (4.15MPa)			
	Inverter		-				Over-current protection Over-heat protection			
	Compressor		-				Over-heat protection			
	PCB		-				Over-current protection			
Refrigerant	Type		-				R410A			
	Charge amount		lbs	(kg)	16.1	(7.3)	18.7	(8.5)	20.9	(9.5)
Refrigeration Oil	Charge amount		gal/Unit	(kg/Unit)	1.6	(6.0)	2.1	(7.9)	2.1	(7.9)
Defrost Method			-				Reversed Refrigerant Cycle			
Main Refrigerant Piping (Heat Pump)	High/Low Pressure Gas Line		in	(mm)	1-1/8	(28.58)	1-1/8	(28.58)	1-1/8	(28.58)
	Liquid Line		in	(mm)	1/2	(12.7)	1/2	(12.7)	1/2	(12.7)

* Rating conditions are based on the AHRI 1230 test standard. See www.ahrinet.org for more information.
** For more detailed operation ranges, please consult YORK sales team or refer to product manuals.
*** External static pressure can be changed via DSW setting 0.24in.W.G.(60Pa).

Ceiling Suspended Indoor Unit

Capacities 15,000 to 36,000 Btu/hr

Tonnage				1.3		2.0		2.5		3.0	
Ceiling Suspended Indoor Unit – Model				**YICS015B21S**		**YICS024B21S**		**YICS030B21S**		**YICS036B21S**	
Power Supply				AC 1Phase, 208/230V, 60Hz							
Nominal Cooling Capacity *		Btu / h	(kW)	15,000	(4.4)	24,000	(7.0)	30,,000	(8.8)	36,000	(10.5)
Nominal Heating Capacity *		Btu / h	(kW)	17,000	(5.0)	27,000	(7.9)	34,000	(10.0)	40,000	(11.7)
Sound Pressure Level (Overall A Scale)		dB		38-35-31-28		43-40-36-31		44-42-37-32		48-45-41-35	
Outer Dimensions	Height	in.	(mm)	9-1/4	(235)	9-1/4	(235)	9-1/4	(235)	9-1/4	(235)
	Width	in.	(mm)	37-13/16	(960)	50	(1270)	62-3/16	(1580)	62-3/16	(1580)
	Depth	in.	(mm)	27-3/16	(690)	27-3/16	(690)	27-3/16	(690)	27-3/16	(690)
Net Weight		lbs.	(kg)	59	(27)	77	(35)	90	(41)	90	(41)
Refrigerant		–		R410A							
Indoor Fan	Air Flow Rate		cfm	530-459-388-318		847-741-635-512		1059-935-777-600		1236-1094-900-706	
	(Hi2-Hi-Me-Lo)		(m^3/min)	(15-13-11-9)		(24-21-18-14.5)		(30-26.5-22-17)		(35-31-25.5-20)	
External Pressure			in.W.G	0.0		0.0		0.0		0.0	
			(Pa)	(0)		(0)		(0)		(0)	
Motor Nominal Output			W	50		80		160		160	
Connections											
Refrigerant Piping				Flare-Nut Connection (with Flare Nuts)							
	Liquid Line		in. (mm)	1/4	(6.35)	3/8	(9.52)	3/8	(9.52)	3/8	(9.52)
	Gas Line		in. (mm)	1/2	(12.70)	5/8	(15.88)	5/8	(15.88)	5/8	(15.88)
Condensate Drain				VP25							
	OD		in. (mm)	1-1/4	(32)	1-1/4	(32)	1-1/4	(32)	1-1/4	(32)
	ID		in. (mm)	31/32	(25)	31/32	(25)	31/32	(25)	31/32	(25)

NOTES:

* Nominal capacity condition is based on the following conditions. See www.ahrinet.org for more information.

COOLING OPERATION CONDITIONS

Indoor Air Inlet Temperature:	80°F DB (26.7°C DB) 67°F WB (19.4°C WB)
Outdoor Air Inlet Temperature:	95°F DB (35.0°C DB)

HEATING OPERATION CONDITIONS

Indoor Air Inlet Temperature:	70°F DB (21.1°C DB)
Outdoor Air Inlet Temperature:	47°F DB (8.3°C DB) 43°F WB (6.1°C WB)

Piping Length: 24 ft. 7-3/16 in. (7.5m)
Piping Lift: 0ft. (0m)

COMMITMENT & INTEGRITY
DRIVE RESULTS

714 Court Street
Lynchburg, VA 24504
www.woodardcurran.com

T 978-482-7918

MEMORANDUM

TO: David Garret, Director of Public Works

FROM: Edgar J. T. Perrow, Jr., P.E.

DATE: August 18, 2016

RE: Altavista, VA WTP Electrical Evaluation, Revised Opinion of Probable Costs

REVISED OPINION OF PROBABLE CONSTRUCTION COSTS:

Upon completion of the WTP Electrical Evaluation, W&C shared the document with two electrical contractors, Southern Air and Moore's Electrical & Mechanical. Of the two, Moore's responded with a thorough and considered evaluation of the construction cost.

The following table indicates W&C's revised Opinion of Probable Cost, based upon the information received by Moore's, broken out by discipline, including design and construction administration fees.

Task	Description	Total Cost
1	General Construction	$20,000
3	Electrical Upgrades	$230,000
5	Mechanical Upgrades	$36,000
6	Engineering Design Fees	$45,000
7	Construction Administration	$15,000
8	Overall Project Contingency - %15	$44,000
	TOTAL	$390,000

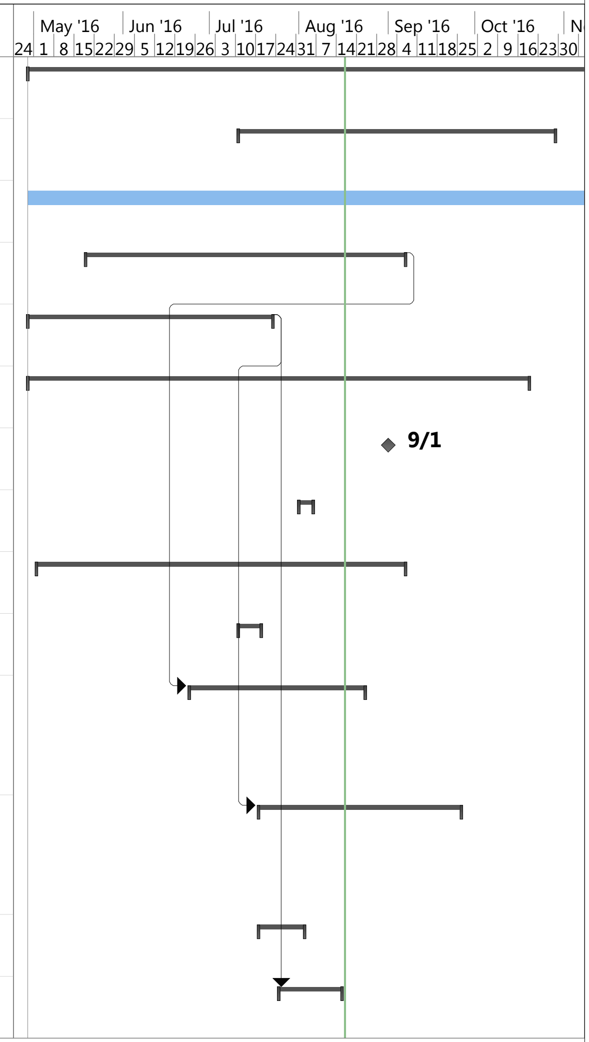
WOODARD & CURRAN PROJECT AND PROPOSAL STATUS		
ACTIVE PROJECT REPORT		
Project	Expected Completion Date	Notes
Task 1 - GIS and Water Modeling	10/28/2016	Mapping complete. Gathering system pressure data for model calibration
Task 2 - SCADA Support	4/27/2016	Ongoing SCADA Service
Task 3 - SCADA*Check*	9/6/2016	Report complete and will be finalized after presentation to Council
Task 4 - WTP & Remote Facilities Electrical Evaluation	7/22/2016	Complete with recommendations
Task 5 - Dominion Power SCADA	10/19/2016	Design complete and panels are in fabrication.
Task 7 - General Engineering Services	8/5/2016	Ongoing engineering service
ACTIVE PROPOSAL REPORT		
Proposal	Status	Notes
Reynold's Spring Fluoride	In Process	
Hurt Water Supply	Issued	
SCADA Phase 1: Abbott Labs, WTP Polling Master, Melinda Repeater	In Process	Recommendation from SCADA*Check* report (Task 3)
Pump Station Process & Structural Evaluations	In Process	Recommendation from WTP & Remote Facilities Electrical Evaluation (Task 4)
Water Reclamation Facility - Phase 1	Issued	
WTP Electrical Upgrades	Issued	Recommendation from WTP & Remote Facilities Electrical Evaluation (Task 4)

8/17/2016

Town of Altavista, Virginia

Woodard & Curran Project Schedule

ID	Indicators	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1			**229783.00 Town of Altavista, Virginia**	**260 days?**	**Fri 4/29/16**	**Thu 4/27/17**	
2			**Task 1 - GIS and Water Modeling**	**80 days?**	**Mon 7/11/16**	**Fri 10/28/16**	
17			**Task 2 - SCADA Support**	52 wks	Fri 4/29/16	Thu 4/27/17	
18			**Task 3 - SCADA Check**	**79 days**	**Thu 5/19/16**	**Tue 9/6/16**	
25	✓		**Task 4 - WTP & Remote Facilities Electrical Evaluation**	**61 days?**	**Fri 4/29/16**	**Fri 7/22/16**	
32			**Task 5 - Dominion Power SCADA**	**124 days?**	**Fri 4/29/16**	**Wed 10/19/1**	
63			**Task 6 - CCUSA Meter Vault SCADA (Proposal)**	**0 days**	**Thu 9/1/16**	**Thu 9/1/16**	
65			**Task 7 - General Engineering Services**	**5 days**	**Mon 8/1/16**	**Fri 8/5/16**	
67			**Task 8 - Reynold's Spring Fluoride (Proposal)**	**92 days**	**Mon 5/2/16**	**Tue 9/6/16**	
76	✓		**Task 9 - Hurt Water Supply (Proposal)**	**6 days**	**Mon 7/11/16**	**Mon 7/18/16**	
79			**Task 10 - SCADA Phase 1: Abbott Labs, WTP Polling Master; Melinda Repeater (Proposal)**	**43 days**	**Fri 6/24/16**	**Wed 8/24/16**	**18**
87			**Task 11 - Pump Station Process & Structural Evaluations (Proposal)**	**50.25 days**	**Mon 7/18/16**	**Mon 9/26/16**	**25**
92	✓		**Task 12 - Water Reclamation Facility - Phase 1 (Proposal**	**12 days**	**Mon 7/18/16**	**Wed 8/3/16**	
98	✓		**Task 13 - WTP Electrical Upgrades (Proposal)**	**16 days**	**Mon 7/25/16**	**Mon 8/15/16**	**25**



WORKSESSION

Agenda Item __5d__

Town of Altavista, Virginia
Worksession Agenda Form

Date: August 23, 2016

Agenda Item: *FY2016 Carryover Request to FY2017 Budget*

Summary: Per the attached memorandum, staff is seeking to carryover the funds associated with items/projects that were in the FY2016 Budget but did not get purchased or finished. Staff requests that the Carryover Requests be approved.

Budget/Funding: Funds from the FY2016 Budget would be moved to the FY2017 Budget.

Legal Evaluation: Town Attorney will be available for questions.

Attachment: Staff Memorandum

Council Recommendation:

☐ Additional Worksession ☐ Regular Meeting ☐ No Action

DATE: August 15, 2016

MEMO TO: Waverly Coggsdale

FROM: Tobie Shelton

RE: FY 2016 / Year End Carryover

Staff is requesting to carryover unexpended funds totaling $224,900 for items/activities that were originally budgeted in FY 2016 that were not purchased/completed during the fiscal year. Staff has identified a need for these items and would like to earmark funds in reserves for the intended items and request a budget amendment to transfer in the funds once items/activities are ready to be purchased.

Below is a list of the items that staff would like to acquire during FY 2017, which covers the period July 1, 2016 through June 30, 2017.

Council / Administration

$25,000 for Classification/Compensation Plan Study. Springsted has begun the process which is estimated to take between 3 to 4 months at a cost of $15,760. Upon completion of the study, staff would like to request the use of remaining funds, estimated to be $9,240, to update the Town's Personnel Policy Manual. The Personnel Policy Manual is in need of an update and now is the opportune time to do so to coincide with the Class and Comp Study.

Public Works

$10,500 to cover the cost to replace both the gasoline pump and the diesel pump at our Public Works Department. Both fuel pumps were failing and were in need of repair. At this time, the gasoline pump has been installed and we are waiting for the installation of the diesel pump.

Water

Several CIP items totaling $67,000 were not replaced at our Water Treatment Plan as planned because the equipment was operating efficiently. These items are: replacement of (2) backwash valves, $17,000, replacement of backwash control panel, $20,000 and replacement of water actuator valves, filters 1-5, $30,000.

Wastewater

Several CIP items totaling $122,400 were not replaced at our Water Treatment Plan as planned because the equipment was operating efficiently. These items are: replacement of autoclave for main lab, $15,000, replacement of two 100hp blowers, $40,000, replacement of polyblend mixer for press system,

$15,000, replacement of polymer pumps for press system, $9,000, and replacement of a 40hp pump and motor at pump station, $15,000.

I respectfully request Council's approval to earmark funds for the above listed items totaling $224,900 in reserves to be expended during FY 2017.