## Forest View Lanes

## Temperance, MI

## 20 Lanes – Remove old Murrey Lanes and old Accuscore+ Scoring.

Install New QAMF SPL Lanes with Approach, Pindecks, Flatgutters, and Transition Blocks. Install BES-X Scoring with Touchscreens, MMS System, and QPAD.

Day 1 – Monday, July 1, 2019 – We arrived very early and unpacked our tools. The center was very ready for the start of our installation – Thanks Rich! They had us an area to stage the new equipment on the Concourse behind lanes 11-20, and an area for our tools behind Pinspotters 1-6 – as we had discussed on Saturday June 29.



Here are pictures of the Center before we started:









We unloaded our tools and placed them behind Pinspotters 1-6, in the area provided by the Center.





The first truck came right on time, and we off-loaded the equipment on this truck. We placed the items that need to be installed toward the backend (like 5 HD Hubs, CenterPunch items, and Qvision Cameras), in the lane 20 walkway. We had determined, that the old Accuscore system is terminated on lane 20, so we need to move this termination to lane 10, so that the old system will continue to work properly on 1-10, as we install the new scoring system on lanes 11-20.



We placed the Bowler's Terminal Pedestals, Monitor Mounting Brackets, 60 Degree Plates, Touchscreens, etc., on the concourse.



We placed the 33 49" Monitors behind the Pinspotters, so they would be in a more secure location.



The second truck also came right on time (an hour later than the first truck), and we offloaded the Lanes and LSL from this Flatbed Truck onto the parking lot.



We brought five of the Alliance Crates inside and placed them on the rear of the approach, then we emptied them and staged the contents.



We assembled our saw stations.



We brought-in the LSL, and then the lane and approach panels, and staged them on the concourse to <u>acclimatize</u>.





We cleaned-up completely in the parking lot, and removed all debris to the dumpster provided by the Center.



We roped-off our staging area with Caution Tape.



Because of limited room inside on the concourse, we staged the 5 Alliance Crates for the next ten lanes outside, at the rear of the building. We covered them with the plastic wrap from the lane panel skids, and stapled the plastic to the Alliance Crates.



It was a great day of work. All equipment was inventoried and brought inside (except the 5 Crates shown above). There were no issues or damage, and there was nothing missing. Daily Hours: 11 (me) + 27 (skilled) + 9 (laborer) = 47. Job Hours: 11 + 27 + 9 = 47.

Day 2 – Tuesday, July 2, 2019 – We first checked all foul units and ball return reset buttons for function. NONE of the foul lights are wired to Terminals 7 & 8 in the A&MC Boxes on the curtainwall. The Center will need to run wire from the Zot Foul unit, to Terminals 7 & 8, if they want the Pinspotter to respond to a foul signal. None of these lanes will post a foul in the new BES-X system until the center connects the Foul Units to posts 7&8 inside the A&MC Boxes on the curtainwall. Further, there is no buzz, and no light whatsoever, at the Zot Foul Unit when the foul line is encroached on lanes 1, 2, 3, 7, 8, 11, 12, 15, and 18. These Zot Foul Units will continue to not work when we are finished. The 10<sup>th</sup> Frame Reset Buttons on the Ball Return Ball Trays did not work on 2, 5, 6, 11, 18, and 20. These reset buttons will continue to not work when we are finished.

We measured the lanes from the lane-side of the foul line, to the center of the headpin on lanes 11-20. They were all more than  $\frac{1}{2}$ " too long (USBC Tolerance is 60' +/-  $\frac{1}{2}$ "), which makes them illegal. I can't believe that these lanes were sanctioned. We will adjust for this when we install the new lanes and pindecks, to make them 60'. We removed all of the old flatgutters, the old maple transition blocks, and the old pindecks. We trashed the flatgutters and transition blocks, but saved the pindecks for the customer. It was a disaster beneath the old pindecks. The pindeck support lumber was split and worthless.



We removed all of this support lumber and installed new.



Then we installed the new pindecks in the center of USBC tolerances.



We removed the Ball Return Ball-Trays and Hoods. We noted all the dimensions for re-installing, and marked the wires for hand drier power and odd/even 10<sup>th</sup> frame switches.



## We removed all foul units.



We removed all Dowel Screw Covers and removed all Lane Screws from the lanes and approaches on lanes 11-20. We began to remove the old pindecks and the old lanes and approaches to skids in the parking lot.



When we got to this point pictured above, we could no longer safely remove lanes and pindecks to the parking lot, since there were many children bowling in close proximity to our lane removal path, even though there were many lanes open for open-bowling on lanes that were not near our removal path, as you can see below.



We wanted to complete the stacks of lanes and pindecks that we started outside, but could not complete the stacks and band the items on the skids. We could not move the skids without spilling the un-banded lanes and pindecks. We will continue tomorrow, when no one is around. We made stacks of the remaining lanes (that we were unable to transport outside) on the approach, so that tomorrow, we could simple load them on a cart and remove.



We finished 7 of the 10 Pindeck Replacements.



The existing Underlayment was secured with  $#6 \ge 1\frac{1}{2}$ " Drywall Screws beyond 7' from the foul line! Unbelievable! Many were broken. The first 7' were secured with a slightly larger screw.



Many of the Lane Panel Joints were not sealed, allowing oil and lane cleaner to penetrate to the MDF Underlayment.



We cleaned-up our work area and rolled-up our tools. Daily Hours: 10 + 24 + 8 = 42. Job Hours: 21 + 51 + 17 = 89.

Day 3 – Wednesday, July 3, 2019 – We finished the last three pindecks – all 10 are properly installed. We removed all of the remaining old lane and approach panels, and skidded/banded as requested by the customer. We also skidded and banded the 10 old pindecks as requested.









We measured back 66' 5/8" from the center of the headpin spots on the newly installed pindecks, and painted a reference line on the maple approach. This line represents a reference point that is 6' behind the JOINT between the new lane panels and the new approach panels. The LANE SIDE of the foul line on our QAMF lane panels, is 5/8" on the Pindeck Side of the joint between the approach panel and the first lane panel. The USBC Specification for the distance from the LANE SIDE of the foul line, to the center of the Headpin is  $60' +/- \frac{1}{2}$ ". When re-measuring 6' toward the pins from our painted reference line, we can locate the JOINT between all approach panels and all first lane panels, which will result in a distance of 60' from the lane side of the foul lines, to the headpins – in the center of the USBC Specification.



We then removed all of the old MDF (medium density fiberboard). There were several different thicknesses of MDF installed on the old installation here. It was bizarre. We removed all of the old MDF to the dumpster. That removal revealed 2 x 6 planks running parallel to the lane on the levelers!



The removal also revealed, that the previous installers cut a 5" Rabbet (cut-out notch) where the MDF met the old Pine Wood Lane. Reason unknown.



The former installers also made their continuous approach cut <u>BETWEEN LEVELERS</u> (you should always make an approach cut on the center of a leveler, so you will have support for both the old maple approach side AND the new LSL or MDF side. All of the old approach <u>is dangling</u> 10" from the nearest rearward leveler. Shocking. There is NO SUPPORT under the Maple Approach Cut. They should have cut HERE.



We will have to add support lumber across the 2 x 10 Stringers, so this approach edge is not dangling - with no support beneath it. We began to remove all lumber and shim materials from the original levelers.



We drilled countersunk pilot holes, and secured the original levelers to the 2 x 10 Stringers with #16 x 4" wood screws. It is very solid.



We began Leveling the Levelers (the crosswise 2 x 4 support for the underlayment), with Shim Paper.



We shimmed the pindeck side of our upcoming LSL installation, to the thickness of our LSL material, so that the new LSL material will mate perfectly with the original Pine Lane. We filled in the Rabbet with Shim Material.



We staged all of the banded skids of old lanes, pindecks and approaches on the side of the bowling center.



We cleaned up, both inside and out, and rolled-up our tools for the day. Daily Hours: 10 + 24 + 8 = 42. Job Hours: 31 + 75 + 25 = 131.



Day 4 – Thursday, July 4, 2019 – We finished removing all old shim material from the levelers.

We finished Shimming the bare levelers level. We fixed the huge problem left by the previous installers, of having NO SUPPORT under the approach cut that the previous installers made. Instead of making the approach cut in the center of a leveler, they cut the approach between levelers, leaving the approach cut without support beneath it, as pictured on Day 3 above. We screwed 2 x 4" material directly to the Stringers (the 2 x 10" support lumber standing on edge, which supports the entire lane installation), centered under this dangling approach cut end. We left the region over the Double Division Ball Return Track unencumbered, since a returning ball would not fit comfortably under our new, (lower) additional support lumber's elevation. We then tightly Stuff-Shimmed the gap between the new 2 x 4" leveler, and the dangling approach end cut (this shim pack).



We then Top-Screwed the Dangling Approach End, so that it is solidly supported by the new leveler and shimpack we added.



We then added shim material to gain the proper elevation for the new LSL we will be installing next.



This totally cured the previous installer's blunder, of cutting the approach IN BETWEEN levelers instead of on the center of a leveler. There is a dangling approach edge no longer. We then drew two strings. One for ensuring the proper elevation for shimpacks to be installed on each of the 18 levelers between the Old Pine Wood Lane and the Maple Approach (that was formerly dangling). The other, to mark the exact location of the 10-side edge of the new LSL we will be installing. We had marked the Zero Board and the #1 Board, with an X on the Maple Approach yesterday. The strings are tight as a piano wire (almost).



We stretched the strings to the other end (pindeck end). Outer LSL String. Leveler Elevation String.





Pine Side of the Outer 10-side LSL Locater String (LSL = Lamented Strand Lumber)

We placed a piece of  $\frac{1}{2}$ " shim material under the Leveler Elevation String on both ends.



Now, using another piece of  $\frac{1}{2}$ " shim material as a gauge-block, we add shim material to each of the 18 exposed levelers, until the shimpack is exactly within this  $\frac{1}{2}$ " gauge-block's thickness, of our stretched elevation string. This ensures flat elevation of the LSL. The average thickness of the Shimpacks needed to get to the desired elevation on each of the 18 exposed levelers, was 1  $\frac{3}{4}$ ". This is an abnormally large amount. We would certainly run out of the usually adequate amount of shim material provided by QAMF to do the job,

before finishing here at Forest View. We had removed many board-feet of 2 x 6" lumber, installed (inexplicably) by the previous installers.



We cut up this 2 x 6" lumber into 41" pieces, to use as leveler shim material, and added the additional  $\frac{1}{4}$ " or so, guaranteeing that we would have plenty of shim material to do the job easily. We shimmed all 18 levelers on all 10 lanes to the proper elevation to be ready for LSL installation.





We added a leveler across the center, centered on a distance of 24' ¼" from the Approach Cut, so we could use two full sheets of LSL to go from the approach cut to within about 3' of the Pine Cut (there was already a leveler 12' from the Approach Cut, so only one additional leveler needed to be installed). This will allow us to use two full sheets of the 12' LSL, to get from the Approach Cut, to within about 3' from the Pine Cut, without wasting any LSL material. Equally importantly, this configuration will nicely break-up the LSL Joints, from the eventual Lane Panel Joints, keeping them very desirably about 4' apart. We set out the first 24' of LSL on 13 - 20 and tacked in place. We made a template for LSL Securing Screw Installation, and marked the LSL Screw Locations on the tacked-down LSL at every leveler location. This ensures that the LSL securing Screws will not interfere with the Lane Panel Securing Screws. We began predrilling the LSL that was tacked in place, and installing the #16 x 4" securing screws. Two lanes of the first 24' of LSL are totally secured.





Daily Hours: 8 + 24 + 8 = 40. Job Hours: 39 + 99 + 33 = 171.

Day 5 – Friday, July 5, 2019 – We finished shimming all levelers, and set-out and tacked in place (under our 10 pin-side outer strings), all of the first 24' of LSL.



We marked all screw-hole locations with our LSL screwhole template and predrilled all screw holes with a 9/32" drill bit on a Fuller Countersink. We secured all LSL with #16 x 4" Wood Screws. We cut-to-fit the last 4' or so, of LSL, beyond the 24' already installed, where the LSL mates with the existing Pine of the original wood lane.



We shimmed for all fill-LSL that goes between the Lane Sheets.



We measured back exactly 6' from our reference line, painted continuously on the maple approach, to relocate the exact position of the joint between the new SPL Lane Panels and the new SPL Approach Panels. We painted this approach/lane panel joint location on each lane.



We use this painted red line to position the LSL Fill Panels slightly behind this Joint Locator. We cut-to-fit and installed all LSL Fill Panels. We cut the Double Fills into three pieces, with a 12" piece in the center, so that the Center could more easily access their Underlane Track beneath the approach, without removing any 5' x 12' Approach Panels. The 12" center Keyway we installed, will allow access to the underlane track, simply by removing the eventual SPL Double Division Fill Panel. No need to remove any of the large Approach Panels.



(I can't believe that the previous installers didn't install a Keyway in their Double Division Approach Fills).

We sanded (with a belt sander) EVERY joint between new LSL and other new LSL, between new LSL and Approach Maple, and between new LSL and Original Pine, to smooth any minor mating inconsistencies.



We cleaned-up the lane area completely.





We removed the old Accuscore Plus Gold Boxes from the Curtainwall on lanes 11-20. We installed the three Netgear switches onto the curtainwall – Slaves, located between lanes 6-7 and lanes 14-15, and the Master between lanes 10-11.





We mounted the 5 HD Hubs and the F<sub>1</sub>Boxes, on the curtainwall for lanes 11-20, in place of the old removed Accuscore Plus Gold Boxes.



Daily Hours: 9 + 24 + 8 = 41. Job Hours: 48 + 123 + 41 = 212.

Day 6 – Saturday, July 6, 2019 – We leveled all of the New LSL and the Old Pine on Lanes 11-20.


We began building the Triple 49" TV Monitor Units, and mounting the 5 HD CPU's onto the new Monitor Frames.



We cut-down a sturdy skid, and strapped it to our Genie Material Lift. We removed the old double monitor assemblies and began replacing with the new Triple Monitors.



We ran the Solid Copper Home Run, that runs from the Master ScoringNet Switch on the curtainwall between lanes 10 and 11, to the Back Office. We ran a 50' Cat5 Cable over the ceiling tiles, from the front desk to the back office. We installed the Back-Office Computer and the Server in the back office. We installed the Front Desk Computer in a temporary location at the front desk, while the old Accuscore system is still running. We installed the Fortigate IGD and the ConquerorNet Netgear switch in the back office, and connected Internet. We wired the ConquerorNet switch to the IGD. We wired the Solid Copper ScoringNet Home Run on both ends and tested (from the Master ScoringNet Switch, directly to the Server). We installed a Front Desk Netgear Switch at the front desk and connected the Cat5 we ran earlier to the IGD from this switch, and added all front desk peripherals, after successful booting. We networked the Front Desk Printer.







We wired all F-Boxes to the Pinspotters. Foul, Cycle, and Second Ball through the C-23 APS MP Chassis Plug, and Manager's Control via terminals 5 & 6 in the A&MC Boxes. We wired LCOM to the Hub and underground to the Qvision Camera location. We wired their existing BCU II modules to the Hub.



We wired all Slave Switched to 5 HD Hub locations on 1-20, and wired Slave #1 and Slave #2 to the Master ScoringNet Switch. We removed all of the old monitors on 11-20 and installed new Triple on 19-20.



We totally cleaned lanes and our work area on 11-20, and set-out all Lane Panels, for final acclimatization (unstacked), tonight and all-day tomorrow (Sunday is off for us).



Here is the Network Diagram for Forest View (without WiFi Qpad included yet):

## Forest View Lanes, Temperance, MI Network Diagram



Daily Hours: 8 + 24 + 8 = 40. Job Hours: 56 + 147 + 49 = 252.

Sunday Off

Day 7 – Monday, July 8, 2019 – We cleaned the Approach area completely, and set-out the Large Approach Panels. We set them in place on our painted lines on the new LSL that mark the perfect distance (60' 5/8'') from the Center of the Head Pin Spots. This will yield 60' (in the middle of the USBC Tolerance of  $60' +/- \frac{1}{2}''$ ) from the lane side of the new foul lines, to the center of the new pindeck Head Pin Spots.





We tacked the Approach Panels in place, to produce a good Board Pattern across the Approach/Lane Joint. Most the original lanes here were over 21" apart across the Singles, so we had to "cheat" the board pattern slightly on either side of each single. But, it ended up very good. This is very common in older original installs of wood lanes. Also, the old lanes were well out of square (to the lane 20 side from front-to-back). This will cause a very slight "stair-step" in the Double Division Fill Panels, where the Fills blend with the Approach Panels. It is very minor. We gapped the Large Approach Panels with .030" of shim material in this hot-and-cold climate region of the country. Two .015" Paper Shims, here.



They turned-out great.



We finished installing the Triple 49" Monitors for BES-X, and leveled them to 113" above the finished approach. We removed the old AccuScore Cameras and wiring.



We lined-up, and tacked in place, all of the first 4 sections of lane panels. We placed a .007" shim paper under all of the approach-sides of the approach/dot-panel joints, to be sure that the approach side of this joint is slightly higher than the lane side – so that a high lane panel side of an approach/lane joint will not exist, to damage bowling balls. We gapped all lane-panel-to-lane-panel joints with .030" of shim paper (two white .015" papers).



We ran all overhead Cat 5 from the 5 HD Hubs on the curtainwall, to the 5 HD CPUs on the Monitor Frames. We installed all Qvision Cameras, and ran all wires to them from the 5 HD Hubs. We removed all of the old AccuScore Bowler's Terminals in the settee area. We ran all underground wire from the 5 HD Hubs on the Curtainwall to the 60-degree Touchscreen pedestal locations. We had to cut off the ends of the Yellow and Beige Touch-Screen Cat 5 wires from the 5 HD Hubs, because the center has only a 1" conduit running from the underground, to the Bowler's Terminal locations. We installed new Cat 5 Ends and tested – all good. We finished all ScoringNet wiring on the curtainwall, and finished F-Box, 5 HD Hub, and A&MC Box wiring.





We plugged-in the Yellow and Beige Com wires from the 5 HD Hubs to Touchscreens (not yet mounted on Bowler's Terminal Pedestals), so we could Reinitialize the system. We entered the proper parameters in Conqueror Lane Setup, and Reinitialized. We ran temporary power to the new 49" Monitors. All BES-X came up fine. We have not done final wiring dress-out on the curtainvall.



We began predrilling and securing all lane and approach panels. We began cutting-in the last common pine panels, where they mate with the new pindecks. Daily Hours: 10 + 27 + 9 = 46. Job Hours: 66 + 174 + 58 = 298.

Day 8 – Tuesday, July 9, 2019 – We sized and installed all 10 rear Pine Panels.



We predrilled, with a 9/64" Vix Bit, all screwholes on the lanes and approaches, and secured with lane screws.



Martin Vera arrived and coached us on QWiFi and Qpad. We installed the four QWiFi units and ran the solid copper wire from the QWiFi units, to the QWiFi Switch in the back office. Then connected the QWiFi Switch to the IGD.



Low End



Golf Area



High End



Bar/ Restaurant Area



We setup the Qpad, with Martin's help. We installed all CenterPunch Pinspotter Pindeck Lights.



We cut 10 lanes of Flatgutters to size, and began installing the Flatgutters and the Transition Blocks.



We installed and tested the Solid Copper wire for the MMS, that runs from the front desk area back to the Master ScoringNet Switch on the Curtainwall between lanes 10 and 11.

We got about half of Flatgutters and Transition Blocks installed. We set them all in the center of the USBC specification of 3.5'' + - 1/8'' – measuring this depth at the 7-10 line.







We drilled pilot holes and plunge-routered the five replacement screw holes, cut off in the sizing and installation of the rearmost Pine Panel on all lanes.

What a great day of work. Thanks Guys! Marty (our QAMF Scoring Trainer), arrived today and began training. The District Sales Manager for this area, Gary Paone, also arrived today to check-in with Owner, Rich Kenny, and to touch base with us. Thanks Gary! Mark Young, my Lane Installer Foreman, is finished with his assignment at the USBC Open Championships – this year in Las Vegas, NV at the SouthPoint venue. He is on the way here to join us for the second half of this install. Safe Travels Mark. Daily Hours 10 + 27 + 9 = 46. Job Hours: 76 + 201 + 67 = 344.

Day 9 – Wednesday, July 10, 2019 – We installed all Double Fills and cut a trap door in the fill. They look great.









<u>We finished the Flatgutters</u>. The lumber under the flatgutters and transition blocks was totally rotten and split. We tore it out and installed new lumber across the Stringers. It is new and solid now. Before -





We installed all Touchscreen pedestals and Touchscreens. We centered them on the Ball Lifts.



We did the final installation of the cameras.



We installed the MMS CPU, Reinitialized and Tested.



We installed all CenterPunch Dimmer Boxes, and the Capping Light Dimmer Boxes, wired the CenterPunch Pit Lights, and installed daisy-chain wires. We addressed the Dimmer Boxes.



We began Sealing all lane panel joints, and setting the Leading/Trailing Edges to USBC Specification. Three Lanes are finished.



We began leveling the new lane panels. We ran the longer TV Monitor Cables provided by QAMF, up into the ceiling and plugged them in. We brought-up lanes 11-20 in Conqueror, so Marty could train tonight. Everything in Conqueror works – except the Pinspotters are not powered-up, as we wait for the final lane sealing, lane leveling, and final testing of all Pinspotter functions.



We cleaned-up the lanes and approaches completely, and removed all trash to the dumpster.





We set-out several Short Approach Panels on our LSL Cutting Table, ready to size and install in the morning.



Daily Hours: 10 + 27 + 9 = 46. Job Hours: 86 + 228 + 76 = 390.

Day 10 – Thursday, July 11, 2019 – We cut-to-size, and installed all of the rear approach panels.





We removed all of the old Single Division Capping and Capping Rope Lights to the dumpster, and installed new Single Division Capping DEAD STRAIGHT. We trapped the Single Capping between two 9" gauge blocks of wood, plus equal amounts of shim material on each side, wedging the capping - centered between the lane panels – ensuring dead straight Single Division Capping (the old capping was atrociously crooked). Straight as a string.



We installed the Capping Lighting and wired to the Dimmer Boxes. We installed the Qvision Reflectors on the new capping. We loaded Pinspotter Parameters into Conqueror, adjusted the Ball Detects on the Cameras, opened lanes and scoped-in the cameras in Conqueror.



We sized and installed all of the Rear Approach Fill Panels. We cut-in a trap door behind every Ball Lift.



We re-installed the Rubber T-Molding that transitions between the rear approach panels and the terrazzo floor.



We re-installed all of the Ball Return Ball Trays and re-wired.



We tested all lanes (11-20) for BES-X Smart Cycle Functions (strike cycle and gutterball cycle). All worked great. We disconnected the Pinspotter Start Switches and taped them off. We made a template for installing an additional screw-row at the rear of the newly installed rear approach panels, and plunged-in new screw holes and secured with lane screws.



We sized the Monitors in HDMI Settings, for a full grid of players. We worked a very long day, because we needed to be confident of a smooth change-over between finishing lanes 11-20, and beginning lanes 1-10. The only feasible time to make this transition, is an early morning, so it must be done tomorrow – or wait until Saturday. We stayed late and got to the point, where we can transition Friday Morning. We coordinated with the Center, to move the furniture from 1-10 tonight – after play (Thursday). First thing in the morning (Friday), we will move our installation materials to the vacated space provided by the center Thursday night, behind lanes 1-10. We will finish the final items on the 11-20 punch-list, and do our final test of all functions for lanes 11-20, before the center opens for play at 11:30 AM Friday. The center can replace the furniture for lanes 11-20 before opening, and be ready for Friday's play to be on the <u>new lanes and scoring</u>. My normal Lane Installation Foreman, Mark Young, arrives tonight (Thursday), after finishing his USBC Open Championships duties at SouthPoint in Las Vegas, NV. It will be great to have him on the second half of this project. Daily Hours: 12 + 33 + 11 = 56. Job Hours: 98 + 261 + 87 = 446.

Day 11 – Friday, July 12, 2019 – We came in very early to be sure to get our final punch-list finished, so the Center could begin using 11-20 today, and we can then start working on lanes 1-10. We leveled the lanes. They were very good and needed only minor adjustments.



We re-installed the Ball Return Brackets for Hoods and re-installed the hoods and the Spare Ball Racks under the ball lift trays.





We moved all of our installation materials for the remaining lanes to the low side of the house, which had been cleared for us by the Center after play last night.



We removed all of the protective plastic from the monitors.



We installed the Maple Starter Blocks and Starter Ramps at the foul line.



We Doweled all screw holes on the lanes and approaches. We re-installed the Foul Lights, and cleaned-up completely.



We removed the Ball Lift Trays and Spare Ball Racks on lanes 1-10.



We removed all of the old scoring equipment from the curtainwall on lanes 1-10.



Daily Hours (Mark arrived, so we now have 6 workers) - me + 4 skilled + 1 laborer: 9 + 32 + 8 = 49. Job Hours: 107 + 293 + 95 = 495.

Day 12 – Saturday, July 13, 2019 – We removed the old Pindecks, Flatgutters, and Transition Blocks on 1-10.



We set out the new Pindecks and installed all of the new Pindecks on 1-10.



We removed all lane and approach dowel screw-covers and screws on 1-10, and removed the old pane panels.



We skidded and banded the old Lane Panels, Approach Panels, Pindecks, and Flatgutters.









We removed three lanes of the old MDF to the dumpster, and cleaned-up our work area.



Daily Hours: 8 + 32 + 8 = 48. Job Hours: 115 + 325 + 103 = 543.

Sunday OFF.
Day 13 – Monday, July 15, 2019 – We finished removing the old MDF, and all old shim materials from the levelers. We shimmed and secured the dangling Approach Maple (described above on Day 4), and shimmed for the new LSL elevation. We shimmed the inexplicable rabbet at the pine end, and for the proper LSL elevation at the pine end. We installed a new leveler centered 24'  $\frac{1}{4}$ " from the approach maple cut. We screwed all levelers to the Stringers with #16 x 4" screws. We leveled the levelers. We drew our strings, and installed all leveler shims to the proper LSL elevation. We installed all of the first 24' of new LSL. ALL of these things were done as pictured and explained above on Days 4 and 5.

We screwed-down  $\frac{1}{2}$ " shim material along the New Approach Panel on Lane 11, to protect the edge until we are ready to install the new approach panel on lane 10.



We began mounting components on the curtainwall for BES-X, and cleaned-up.



Daily Hours: 9 + 32 + 8 = 49. Job hours: 124 + 357 + 111 = 592.

Day 14 – Tuesday, July 16, 2019 – We removed the old Accuscore Front Desk Terminal. We moved the new BES-X Front Desk Terminal from its temporary location (as we used two separate systems simultaneously), to the permanent location – where Accuscore used to be.



We finished securing the new LSL panels. We shimmed for LSL Fills and cut-in the last LSL panel, where it mates with the old wood lane pine. We cut-to-fit and installed all LSL approach fills. We sized all of the Flatgutters and began installing them, along with the new Transition Blocks. 5 lanes are completely installed. We installed all CenterPunch Pit Lights on lanes 1-10. We completely wired the F-Boxes to the Pinspotters, 5 HD Hubs, and BCU's on the curtainwall. We ran the underground wires from the 5 HD Hubs and Pinspotters, to the Qvision Camera locations. We sanded all LSL joints, where the new LSL mates with the old wood-lane pine, the approach maple, and other LSL. We leveled the New LSL and the old pine. We cleaned-up and laid-out the lane panels for lanes 1-10.

ALL, as described and pictured above on days 5 and 6. We are over 2 days ahead of the pace from lanes 11-20 (three days ahead if including our Day 1, which was all Truck Unloading).



Daily Hours: 11 + 36 + 9 = 56. Job Hours: 135 + 393 + 120 = 648.

Day 15 – Wednesday, July 17, 2019 – We set in place, and secured all approach panels for lanes 1-10. Just like lanes 11-20, all of the lanes point to the right. The original layout for this center was AT LEAST 1" out of square over the 79' from the start of the approach, to the Zero Line (1 13/16" behind the 7-10 row of pin spots). This is like a mile in bowling lane terms. We had to follow the original wood lane, and adjusted our new lane panel installation for the lurch toward the 10-side on every lane. It turned our very well. We will have a slight stair-step at the Double Division Fill panels, across the doubles. We were stuck with the location of the old approach panel on lane 10, when we installed lanes 11-20, since we were not allowed to replace all lanes at once. Without being able to remove all 20 lanes at once (at the customer's request), we had to use the old lane 10 approach as our starting point. The old synthetic approaches and lanes were <u>even more</u> out of square than the original wood lanes. We made the adjustment for the new QAMF SLP approaches at the lane 10/11 mating joint, and continued on with slight adjustments to follow the 10-side-pointing existing lanes. We positioned and tacked in place, the first four lane panels on 1-10. We cut-in the last pine panel on lanes 1-10 and tacked in place. All lanes are positioned properly, and there were no issues.

We began pre-drilling all lane and approach panel screw holes, and securing with lane screws. We finished the Flatgutters and Transition Blocks on all lanes. We finished the BES-X scoring wiring on the curtainwall, and began to run the underground wires. We had a great deal of trouble getting the underground wires to the Touchscreen locations on lanes 7-10. We finally broke through on 9-10, but lanes 7-8 are still a problem. The wires through the underground conduit are "welded" in place by corrosion in these tiny pipes that run from the rear of the approach, to the Touchscreen locations – 2 steps up from the approach elevation. We dissolved the blockage on lanes 9-10, and were able to pull our wires through, but 7-8 is blocked terribly. We shot-in some corrosion solvent and will let it sit overnight. We ran all overhead wires to the Monitor/CPU locations, and ran all of the long Monitor Power Wires to the ceiling power source. We removed all of the old TV Monitors and mounting frames on 1-10, and built and installed the new Triple Monitor Assemblies on 3 of the 5 remaining pairs. ALL OF THE ABOVE, were installed as explained and pictured earlier in this log. We disposed of all trash and cleaned-up our work area. Daily Hours: 10 + 32 + 8 = 50. Job Hours: 134 + 389 + 119 = 642.

Day 16 – Thursday, July 18, 2019 – We cut-in all Double Division Fill Panels and secured. We finished all Triple Monitors. We ran all underground and overhead wires for BES-X. We installed 1-10 Touchscreens and pedestals, and wired. We installed all Qvision Cameras and wired. We finished predrilling and securing all approach and lane panels, and secured with lane screws. We shimmed for USBC Leading/Trailing Edge lane panel joint tolerances, and sealed all Lane Panel Joints. We removed all of the old single division capping and installed all Capping Lighting Capping, the capping lights and diffusers. We plunged-in new lane/approach panel securing screw holes in the last pine panel and at the rearmost end of the newly installed rear approach panels and secured. We reinitialized BES-X on lanes 1-10. All came up fine.



We sent Pinspotter parameters to 1-10. We loaded animations. All of this Day 16 was done as described and pictured above on Days 9 and 10.

We boxed the 10 Accuscore Gold Boxes with RA's and shipping labels, took them to UPS store, and returned to Richmond.



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Daily Hours: 10 + 36 + 9 = 55. Job Hours: 144 + 425 + 128 = 697.

Day 17 – Friday, July 19, 2019 – We cut-in all rear approach panels. We sized and installed all rear approach fill panels, and secured. We plunged-in new securing screws holes on the newly installed rear approach panels and secured. We finished all new Capping and Capping Lights on the Single Divisions. We daisy-chained the capping lighting to all dimmer boxes and to the CenterPunch Server and tested – all good. We tested all functions of BES-X on lanes 1-10 and all was good. We removed all protective plastic from the monitors. We finished sealing all panel joints, and setting leading/trailing edges to USBC specification. We re-installed all Ball Return Ball Trays, Hoods, and Spare Ball Storage racks. We re-installed the rubber transition between the Rear Approach and the Settee floor.



We did final installation of the Qvision Cameras. We installed the new Ball Detect Reflectors (on the new capping), and scoped-in the cameras and ball detects. All as explained and pictured earlier in this report.

We did the final wire tying of the new triple monitors and installed the chain covers.



We installed and configured the new wired Pin Pad that we received a couple of days ago.



We tested and found a bad Pinspotter Pit Light Dimmer Box. We ordered a replacement through Tech Support. The bad dimmer box works, but always displays the wrong color on the Pinspotter. We moved the bad Pit Light Dimmer Box to lanes 1 and 2. All of the rest work perfectly. We sized and installed the outer approach fills, outside of lanes 1 and 20, and shimmed all approach for proper leading/trailing edge transitions.



We Doweled the Approach completely.



We did final wire-tie of the Curtainwall.



We began and completed final leveling of the lanes. We began doweling the leveled lanes. Three completed. We cleaned-up completely. All that is left for Saturday is to install Maple Starter Blocks, reinstall Foul Lights, reinstall starter ramps, finish Doweling the lanes, and do final testing of all functions. Daily Hours: 10 + 32 + 8 = 50. Job Hours: 154 + 457 + 136 = 747.

Day 18 – Saturday, July 20, 2019 – We finished installing chain covers on the remaining TV Monitors - lanes 11-20. We installed the Maple Starter Blocks and reinstalled the round gutter Starter Ramps. We reinstalled the Foul Lights on 1-10 and checked/adjusted ALL foul lights on 1-20. We have 4 signal-strength LED indicators on all 20 lanes of Foul Lights. We finished Doweling all lanes, pindecks, and approaches. We disconnected the Pinspotter Start Switch wires on 11-20, and wired the Rear Pinspotter Control Boxes on 1-20, to allow Mechanic's Cycle. ALL, as described and pictured above.

We installed The MMS Monitors where the customer wanted them.



We tested all lanes for all functions. There was a problem with Pinspotter Power-On on Lane 3, but it was simply caused by the power switch on the F-Box being off. We turned-on the F-Box Pinspotter Power Switch and tested – Fine. We may have accidentally switched it off while doing final wire-tying. All functions worked fine, except Foul, because the center does not have the Foul Light Units, wired to terminals 7 & 8 in the A&MC (Approach & Manager's Control) Boxes on the curtainwall. There must be a 12 VAC signal sent to the A&MC Boxes from the foul lights, when a foul occurs, for Conqueror to recognize the Foul Signal. This signal is monitored by the MP Chassis and wired directly from the MP Chassis APS plug, to the F-Box. If the center provides the 12 VAC signal to terminals 7&8 in the A&MC Boxes, the Foul Cycle will work in Conqueror. The Powerlift on 5-6 would not come on with the Pinspotters. We didn't at all mess with the Powerlift's Power Circuits. We only disconnected the Hand Dryer and the Reset Buttons. We have no idea why this Powerlift didn't work when we turned on all lanes. We inspected the Powerlift Control Box under the approach at the Ball Tray, and noticed that there was a terminal on the Fuse Holder that was broken off. We will meet with the Mechanic tomorrow or Monday to fix the issue. The Mechanic hasn't been here at the center during our installation hours (except for one day). There is a lot we need to train him on, but he was unavailable for all but one of the last 3 weeks while we were installing the equipment. We arranged to train him either tomorrow or Monday on Spare Parts, Ball Detect Adjustment, and Qvision Camera Adjustment in Conqueror. The Center will let us know when the Mechanic might be available. We are expecting the defective Pin Light Dimmer on Monday, so we are waiting here today, tomorrow and Monday, and at the Center's disposal, to fix 5-6 Powerlift, the Dimmer Box on 1-2, train the mechanic on Qvision, and explain all Spare Parts. We tested (some last week and some this past week, and some today), all of the spare parts. All Good. We marked them good as of today.



A Flat Bed Truck arrived to transport the used Lanes, Approaches, Pindecks, and Flatgutters to a buyer arranged by the Forest View Owner. We loaded these items on the Flatbed Truck, as a favor to the Forest View Owner, Rich Kenny, with our Forklift. I extended my Forklift Rental for 3 days longer than I needed it, as a courtesy to Rich.



We removed all trash to the Dumpster. We packed all of our tools, and cleaned up.





Daily Hours: 10 + 28 + 7 = 45. Job Hours: 164 + 485 + 143 = 792.