1. For each entity

* Employee(employeeID,fName, lName)
* Role(roleID, description, roleName)
* Design(designID, description, signoffDate)
* Customer(customerID, custFName, custLname, custCity, custProv, custStreet, custPostalCode)
* Invoice(invoiceID, issueDate, paidDate)
* Labour(labourID, description, hourlyCharge, type, labName)
* InvoiceLabourLines(invoiceLabourID, hours, price)
* InvoiceLines(invoiceID, quantity, price, quantityOnOrder)
* Items(itemID, type, size, costPrice, listPrice, quantityOnHand, quantityReserved, quantityOnOrder)
* Supplier(supplierID, supFName, supLName, supCity, supProv, supStreet, supPostalCode)

1. For each relation

“fills” 1:M

* EmployeeRole(employeeID(fk))
* Constraint:
  + EmployeeRole(employeeID(fk)) References Employee(employeeID)

“needs to be filled” 1:M

* EmployeeRole(employeeID(fk), roleID(fk))
* Constraints:
  + EmployeeRole(employeeID(fk)) References Employee(employeeID)
  + EmployeeRole(roleID(fk)) References Role(roleID)

“is part of” 1:M

* DesignEmployees(employeeID(fk), roleID(fk))
* Constraints:
  + DesignEmployees(employeeID, roleID (fk)) references EmployeeRole(employeeID, roleID)

“is handled by” 1:M

* DesignEmployees(employeeID(fk), roleID(fk),designID(fk))
* Constraints:
  + DesignEmployees(employeeID, roleID (fk)) references EmployeeRole(employeeID, roleID)
  + DesignEmployees(designID(fk))

“purchases” 1:M

* Design(designID, description, signOffDate, customerID(fk))
* Constraint
  + Design(customerID(fk)) references Customer(customerID)

“has” 1:M

* Invoice(invoiceID, issueDate, paidDate, designID(fk)
* Constraint
  + Invoice(designID(fk)) references Design(designID)

“contain” 1:M

* InvoiceLabourLines(invoiceLabourID, hours, price3, labourID(fk))
* Constraint
  + InvoiceLabourLines(labourID(fk)) references Labour(labourID)

“are part of” 1:M

* InvoiceLabourLines(invoiceLabourID, hours, price3, labourID(fk), invoiceID)
* Constraint
  + InvoiceLabourLines(labourID(fk)) references Labour(labourID)
  + InvoiceLabourLines(linvoiceID(fk)) references Invoice(invoiceID)

“contain” 1:M

* InvoiceLines(invoiceID, quantity, price, quantityOnOrder, itemID(fk))
* Constraint
  + InvoiceLines(itemID(fk)) references Items(itemID)

“are part of” 1:M

* InvoiceLines(invoiceID, quantity, price, quantityOnOrder, itemID(fk),invoiceID(fk))
* Constraint
  + InvoiceLines(itemID(fk)) references Items(itemID)
  + InvoiceLines(invoiceID(fk)) references Invoice(invoiceID)

“supplies” 1:M

* Items(itemID, type, size, costPrice, listPrice, quantityOnHand, quantityReserved, quantityOnOrder, supplierID(fk))
* Constraints:
  + Items(supplierID(fk)) references Supplier(supplierID)

1. Weak entities to Strong

EmployeeRole, DesignEmployees - Have been assigned PKs as FK’s. This will ensure uniqueness

Labour – has been assigned a surrogate key.

1. Review & consolidate

No changes made that need to cascade.

All items are uniquely identified

There is no data that is being duplicated

1. Final Schema

* InvoiceLines(invoiceID, quantity, price, quantityOnOrder, itemID(fk),invoiceID(fk))
  + Constraint
    - InvoiceLines(itemID(fk)) references Items(itemID)
    - InvoiceLines(invoiceID(fk)) references Invoice(invoiceID)
* Items(itemID, type, size, costPrice, listPrice, quantityOnHand, quantityReserved, quantityOnOrder, supplierID(fk))
  + Constraints:
    - Items(supplierID(fk)) references Supplier(supplierID)
* InvoiceLabourLines(invoiceLabourID, hours, price3, labourID(fk), invoiceID)
  + Constraint
    - InvoiceLabourLines(labourID(fk)) references Labour(labourID)
    - InvoiceLabourLines(linvoiceID(fk)) references Invoice(invoiceID)
* EmployeeRole(employeeID(fk), roleID(fk))
  + Constraints:
    - EmployeeRole(employeeID(fk)) References Employee(employeeID)
    - EmployeeRole(roleID(fk)) References Role(roleID)
* Invoice(invoiceID, issueDate, paidDate, designID(fk)
  + Constraint
    - Invoice(designID(fk)) references Design(designID)
* DesignEmployees(employeeID(fk), roleID(fk),designID(fk))
  + Constraints:
    - DesignEmployees(employeeID, roleID (fk)) references EmployeeRole(employeeID, roleID)
    - DesignEmployees(designID(fk))
* Design(designID, description, signOffDate, customerID(fk))
  + Constraint
    - Design(customerID(fk)) references Customer(customerID)
* Employee(employeeID,fName, lName)
* Role(roleID, description, roleName)
* Customer(customerID, custFName, custLname, custCity, custProv, custStreet, custPostalCode)
* Labour(labourID, description, hourlyCharge, type, labName)
* Supplier(supplierID, supFName, supLName, supCity, supProv, supStreet, supPostalCode)